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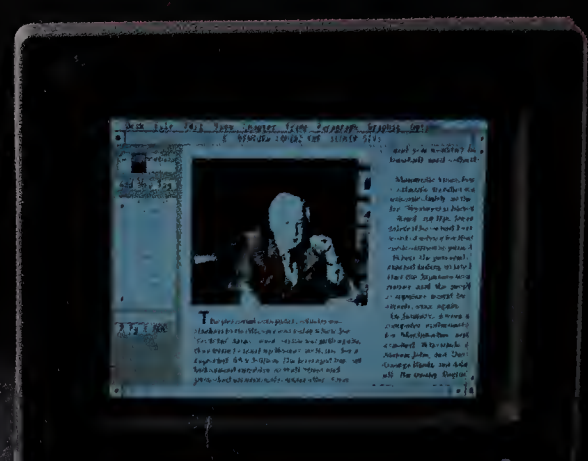

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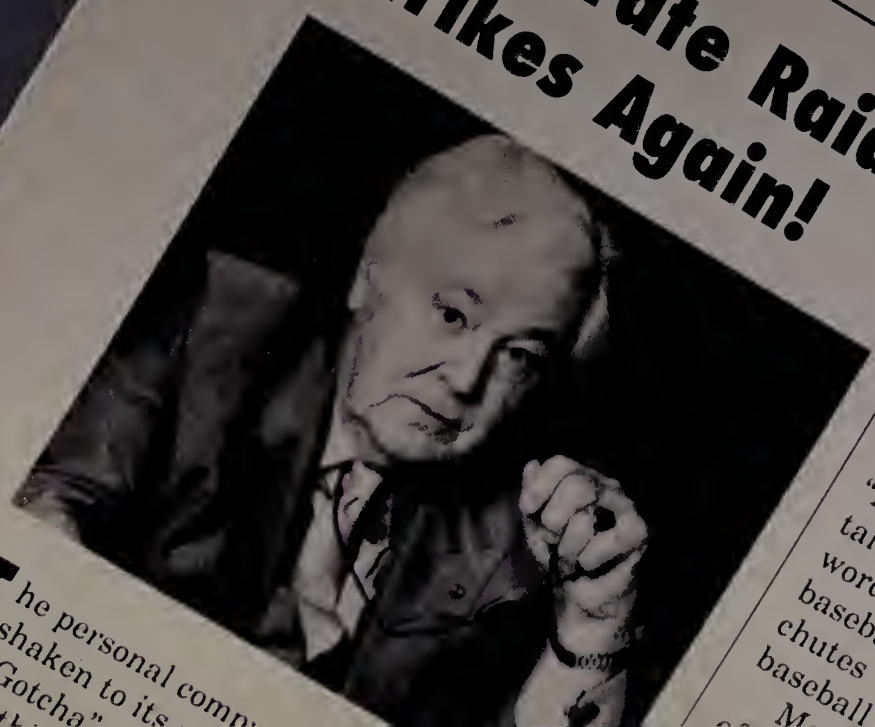

Tender Times

Corporate Raider Strikes Again!

The personal comp
shaken to its
Joe "Gotcha"
again, th
Inc.

said Inyerface, "and you
the depth of my baseball c
Meanwhile Ames, found di
Gotham's trendier watering
laughed uncontrollably at the
the counteroffer.
"Wysiwysi is history," cracked
"Read my lips. Inyerface couldn
talize if he owned Fort Kno
word of advice for that
baseball cards—in
chutes would
baseball

Why You Should Consider The Dell 386 Systems, Despite Their Suspiciously Low Prices.

Our 386-based systems are priced about 35% less than comparable systems–like Compaq's. Which may make you wonder if we've left something important out. Like high performance.

Well we haven't.

In fact, these are among the fastest 386-based systems available. With more advanced features than you'd get in systems that list for up to $3000 more.

Like Compaq's.

For instance, our 20 MHz System 310 offers you the best value available in any 386-based system. PC Magazine (6/14/88) describes it as "fast enough to burn the sand off a desert floor."

And If That Sounds Fast, Wait Till You See Our New 25 MHz 386-Based System.

At 25 MHz, our new System 325 offers you the highest possible performance in a 386. Like the System 310, it utilizes the very latest technology, including the Intel 82385 Cache Memory Controller, advanced 32-bit architecture and high performance drives. And of course, both systems are fully IBM PC compatible. (For more detailed specifications, see the inside pages.)

But speed isn't the only reason to buy from us. Or even the best reason.

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And if your system requires hands-on service, a technician will be at your location the next business day. At absolutely no charge to you. Because included in the price of your system is a full year of on-site service.

But that's not all. You also get our 30-day money-back guarantee. As well as our one-year limited warranty on parts and workmanship.

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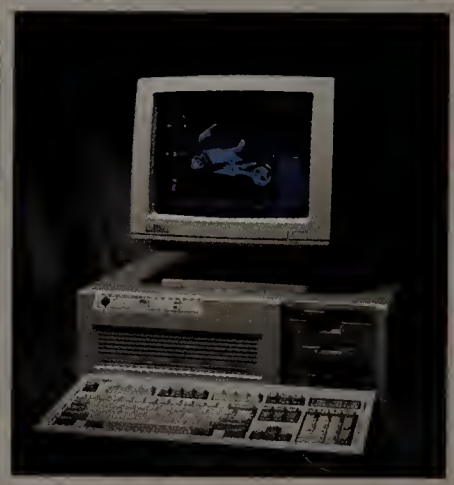

THE NEW 25 MHz 386 SYSTEM 325.

When you need the highest possible performance of any 386, this is the technology of choice. Running at 25 MHz, the System 325 is faster than the Compaq^ 386/25. Besides unequaled speed, it also offers Intel's^ Advanced 82385 Cache Memory Controller and high performance disk drives. As a result, it gives you workstation-level performance for CAD/CAM and desktop publishing applications. It's also especially effective as a network file server, and more than capable of handling the most complex spreadsheets and databases.

STANDARD FEATURES:

- Intel^ 80386 microprocessor running at 25 MHz.
- 1 MB of RAM* expandable to 16 MB using a dedicated high speed 32-bit memory slot.
- Advanced Intel 82385 Cache Memory Controller with 32 KB of high speed static RAM cache.
- Page mode interleaved memory architecture.
- VGA systems include a high performance 16-bit video adapter.
- Socket for 25 MHz Intel 80387 or 25 MHz WEITEK 3167 math coprocessor.
- 5.25" 1.2 MB or 3.5" 1.44 MB diskette drive.
- Dual diskette and hard disk drive controller.
- Enhanced 101-key keyboard.
- 1 parallel and 2 serial ports.
- 200-watt power supply.
- 8 industry standard expansion slots.

OPTIONS:

- 25 MHz Intel 80387 math coprocessor.
- 1 MB or 4 MB memory upgrade kit.
- 2 MB or 8 MB memory expansion board kit.

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System 325	With Monitor & Adapter	
Hard Disk Drives	VGA Mono	VGA Color Plus
150 MB-18 ms ESDI	$6,799	$7,099
322 MB-18 ms ESDI	$8,799	$9,099

The Dell System 325 is an FCC Class A device, intended for business use only.

THE DELL 20 MHz 386 SYSTEM 310.

For business users who need a 386 system, this is the best combination of performance and value available. Running at 20 MHz, this 32-bit system is faster than the IBM PS/2^ Model 70 and the Compaq 386/20e. Since it has the same high performance disk drives and Intel Advanced 82385 Cache Memory Controller as our System 325, it brings a new level of performance to complex spreadsheets and databases. As you might expect, it runs windowed software at extremely high speed. It's also well-suited for desktop publishing applications, or as a network file server.

STANDARD FEATURES:

- Intel 80386 microprocessor running at 20 MHz.
- 1 MB of RAM* expandable to 16 MB using a dedicated high speed 32-bit memory slot.
- Advanced Intel 82385 Cache Memory Controller with 32 KB of high speed static RAM cache.
- Page mode interleaved memory architecture.
- VGA systems include a high performance 16-bit video adapter.
- Socket for 20 MHz Intel 80387 or 20 MHz WEITEK 3167 math coprocessor.
- 5.25" 1.2 MB or 3.5" 1.44 MB diskette drive.
- Dual diskette and hard disk drive controller.
- Enhanced 101-key keyboard.
- 1 parallel and 2 serial ports.
- 200-watt power supply.
- 8 industry standard expansion slots.

OPTIONS:

- 20 MHz Intel 80387 math coprocessor.
- 1 MB or 4 MB memory upgrade kit.
- 2 MB or 8 MB memory expansion board kit.

***Lease for as low as $140/Month.*

System 310	With Monitor & Adapter	
Hard Disk Drives	VGA Mono	VGA Color Plus
40 MB-28 ms	$3,899	$4,199
90 MB-18 ms ESDI	$4,699	$4,999
150 MB-18 ms ESDI	$5,199	$5,499
322 MB-18 ms ESDI	$7,199	$7,499

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THE DELL 20 MHz 286 SYSTEM 220.

It's an 80286 system that's as fast as most 386 computers. But at less than half the price. Which means you get the best price/performance of any system. The System 220 runs at 20 MHz, with less than one wait state. It also features complete compatibility with Microsoft MS-DOS and MS OS/2, plus a remarkably small footprint. The System 220 is the ideal executive workstation.

STANDARD FEATURES:

- 80286 microprocessor running at 20 MHz.
- 1 MB of RAM* expandable to 16 MB† (8 MB† on system board).
- Page mode interleaved memory architecture.
- Integrated diskette and VGA video controller on system board.
- Socket for Intel 80287 math coprocessor.
- One 3.5" 1.44 MB diskette drive.
- Integrated high performance hard disk interface on system board.
- Enhanced 101-key keyboard.
- 1 parallel and 2 serial ports integrated on system board.
- 3 full-sized industry standard expansion slots available.

OPTIONS:

- External 5.25" 1.2 MB diskette drive.
- 3.5" 1.44 MB diskette drive.
- Intel 80287 math coprocessor.
- 1 MB RAM upgrade kit.

***Lease for as low as $85/Month.*

System 220	With Monitor	
Disk Drives	VGA Mono	VGA Color Plus
One Diskette Drive	$2,299	$2,599
40 MB-29 ms Hard Disk	$2,999	$3,299
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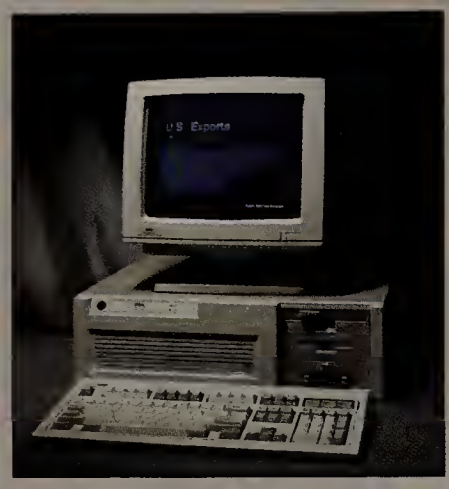

THE DELL 12.5 MHz SYSTEM 200.

A great value in a full-featured AT compatible. An 80286 computer running at 12.5 MHz, this computer is completely Microsoft MS-DOS and MS OS/2 compatible. The System 200 offers high speed drive options, industry standard compatible BIOS and on-site service. As Executive Computing said of this computer's predecessor, "If faster processing speed and low cost are two key issues affecting your purchase decision, this machine might be the ideal choice for your office."

STANDARD FEATURES:

- 80286 microprocessor running at 12.5 MHz.
- 640 KB of RAM expandable to 16 MB† (4.6 MB† on system board).
- Socket for Intel 80287 math coprocessor.
- 5.25" 1.2 MB or 3.5" 1.44 MB diskette drive.
- Dual diskette and hard disk drive controller.
- Enhanced 101-key keyboard.
- 1 parallel and 2 serial ports.
- 200-watt power supply.
- 6 industry standard expansion slots.

OPTIONS:

- Intel 80287 math coprocessor.
- 512 KB RAM upgrade kit.

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*PERFORMANCE ENHANCEMENTS (SYSTEMS 325, 310 AND 220):

640 KB is available for programs and data. The remaining 384 KB is reserved for use by the system to enhance performance.

†Using 1 MB SIMMs. Inquire as to availability.

System 200	With Monitor & Adapter	
Hard Disk Drives	VGA Mono	VGA Color Plus
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90 MB-18 ms ESDI	$3,499	$3,799
150 MB-18 ms ESDI	$3,999	$4,299
322 MB-18 ms ESDI	$5,999	$6,299

LASER PRINTERS AND MORE.

The obvious companion for a high performance Dell system is a Dell laser or dot matrix printer. All printers come with 30-day money-back guarantee. And be sure to ask about our software offerings, which include most popular third-party applications as well as Dell Enhanced operating system software.

LASER PRINTERS.

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Laser System 60, 6 pages per minute:	$2,195.

All Dell laser printers come with 1.5 MB RAM, full-page 300 DPI graphics, and have 31 standard fonts (7 resident and 24 down-loadable from diskette). Dell laser printers also provide Hewlett-Packard LaserJet,^ Epson/FX,^ IBM Proprinter^ and Diablo 630^ emulations.

DOT MATRIX PRINTERS.

Printer System 800: $699.95.

Our highest resolution text and graphics, 24-pin dot matrix printer. Draft quality at 200 cps. Letter quality at 66 cps. Parallel and serial interfaces. Wide carriage.

Printer System 600: $499.95.

9-pin dot matrix. Draft quality at 240 cps. Near-letter quality at 60 cps. Parallel interface. Wide carriage.

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9-pin dot matrix. Draft quality at 144 cps. Near-letter quality at 36 cps. Four standard fonts. Parallel interface. Narrow carriage.

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Dell Enhanced Microsoft MS-DOS 4.0:	$119.95

(Both MS-DOS versions with disk cache and other utilities)

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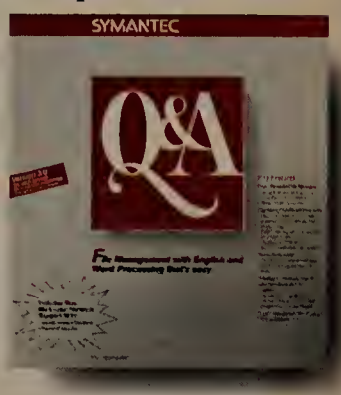

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Circle 108 on reader service card

The Bus Stops Here

East Coast Editor
Eric Bender

RICHARD HOWARD

When East Coast Editor Eric Bender heard that he was to be featured on this page, he immediately suggested we photograph him outside a Greyhound terminal. Our man in Boston can be forgiven his temporary obsession with buses: For this month's "Bus Wars" feature, Bender spent much of last fall wading through technical jargon and marketing hype with the designers and executives behind IBM's Micro Channel Architecture and the rival Extended Industry Standard Architecture bus.

"The marketing claims are way ahead of the hardware or user needs," he reports. "Both groups are laying down solid foundations for the hardware of the nineties, and that's to be applauded. But the hype is also flying."

Bender, who edits *Industry Outlook* for *PC World*, argues that the incompatible buses have helped draw the curtain on what software author Robert Carr calls the "Golden Age"—when PCs came with a single operating system and a single hardware platform. "In the best of all worlds, two competing architectures would not have emerged. Yes, one may bring an added feature or marginally higher performance, but the benefits are outweighed by the need for dual third-party development efforts. Peripherals suppliers will be reinventing every other wheel."

And how should PC buyers react to the controversy over which bus to catch? "Think about the bus as just one component in the buying decision," Bender recommends. "The AT bus will meet most users' needs for years. And any major enhancement product will support both advanced architectures, so the choice of bus should not be the be-all and end-all."

Also in this issue: If you thought no laser printer could outperform Hewlett-Packard's venerable LaserJet Series II, think again: Daniel Kehoe ("Can Anything Beat the Series II?") has the lowdown on six high-performance LaserJet alternatives. Does the latest release of *Ventura Publisher* suffer from a split personality? Steve Roth ("Ventura Turns Two") offers an insightful analysis. Our expanded How To section includes the ultimate collection of *Framework* hints, some sage advice for keeping your CompuServe bill in line, and a nifty phone trick for *SideKick*. Finally, if you break into a cold sweat at the thought of tackling Form 1040 on your own, check out our Buyers' Guide to personal tax preparation software. Alan Southerton and Cameron Wicker have assembled 13 certified electronic accountants—in plenty of time to beat the April 15 deadline. ●

Ed Bott

Ed Bott
Managing Editor

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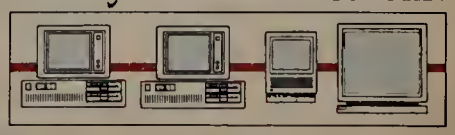

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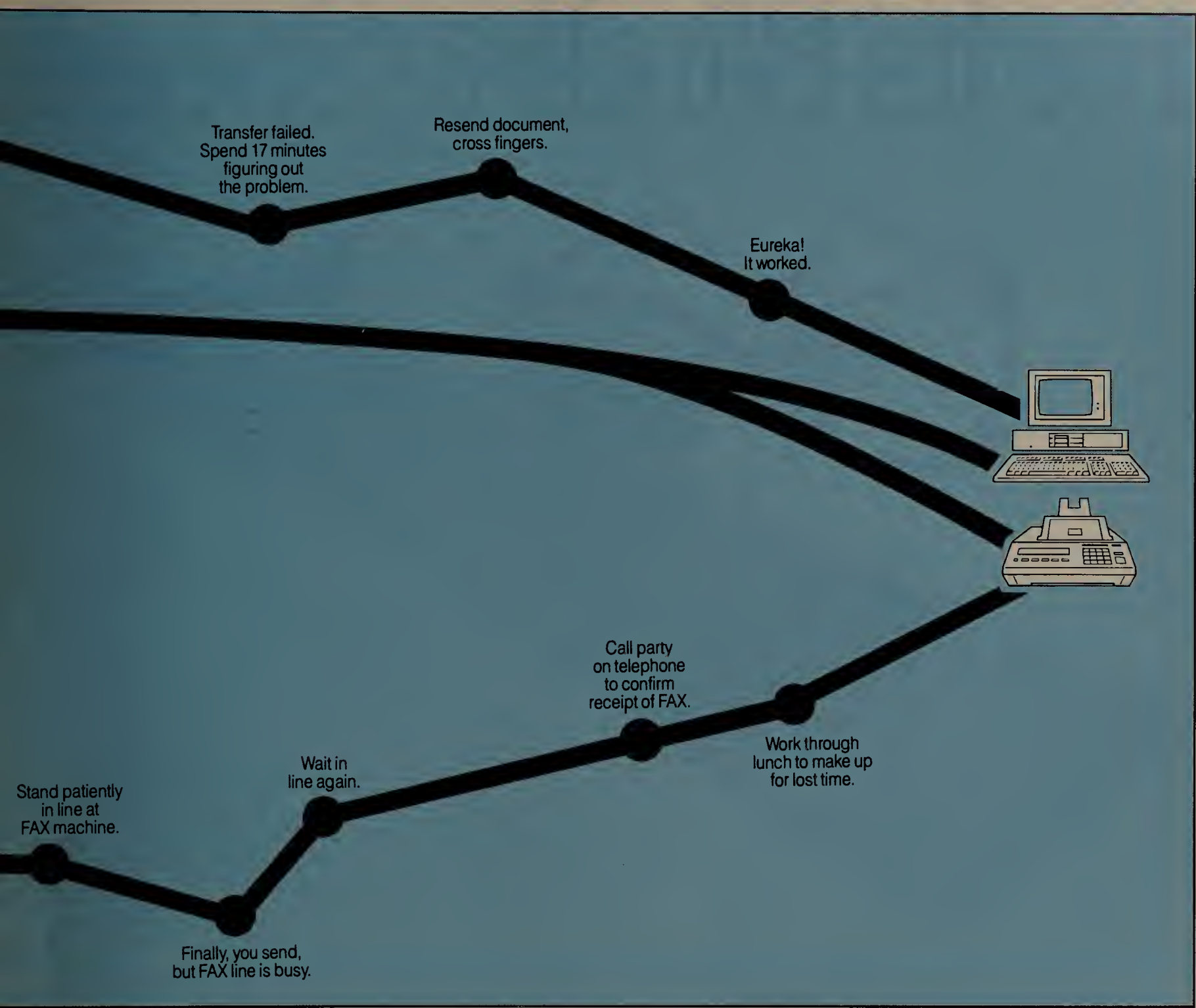

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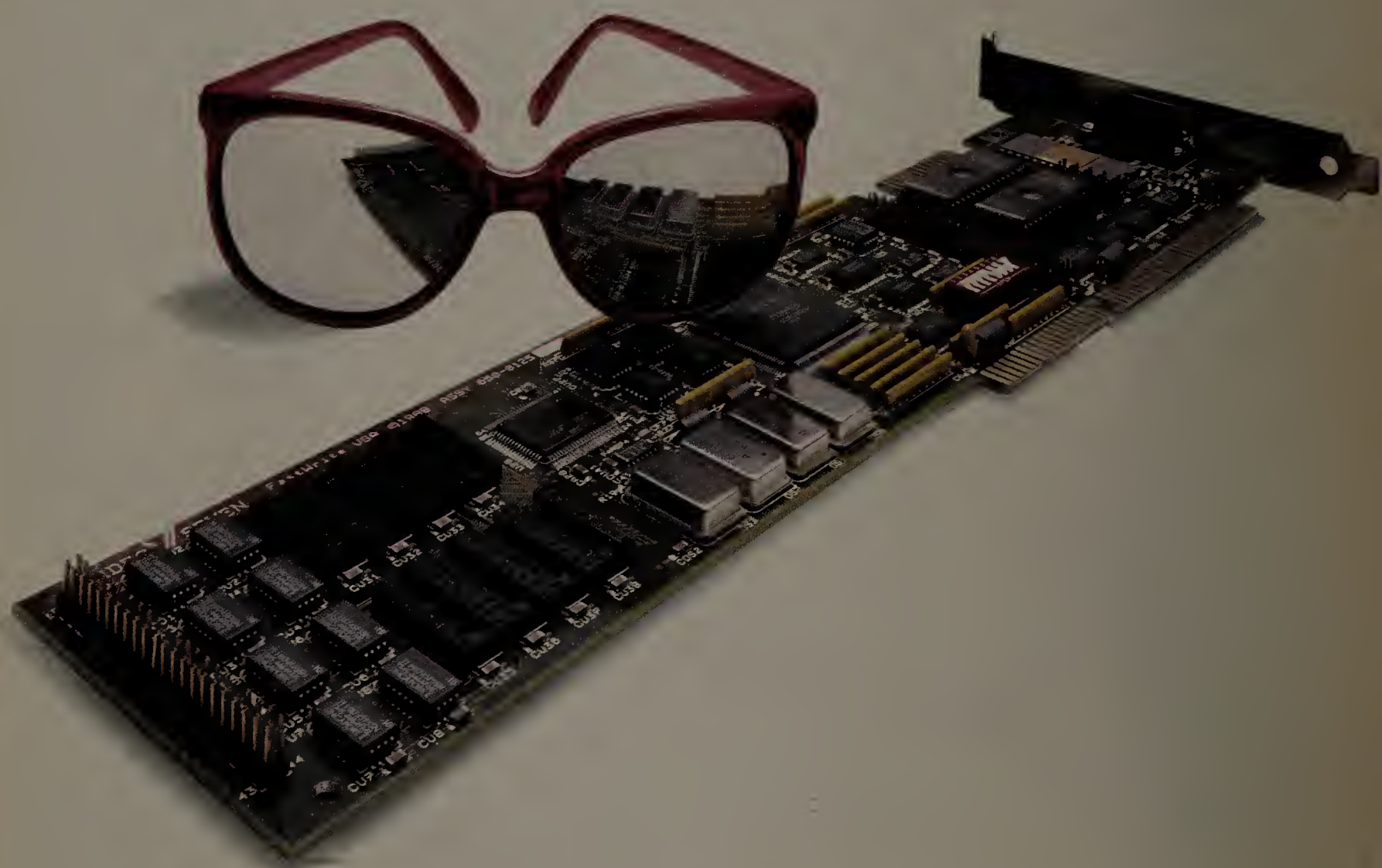

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Circle 277 on reader service card

Lowe Leaves IBM

Top PC Executive Joins Xerox

William Lowe, president of IBM's Entry Systems Division (ESD) since 1985, has left to become an executive vice president at Xerox Corporation. As head of IBM's Boca Raton lab in 1980, Lowe approved development of the original PC, but achieved much greater recognition during the past two years as point man for the PS/2 with its controversial Micro Channel Architecture. He will be replaced by James Cannavino, previously head of IBM's Data Systems Division, the large-systems group. Cannavino will take over a somewhat smaller ESD since an Advanced Workstations Division is being spun off to handle AIX (IBM's UNIX derivative) and the RT PC. This new division will be headed by Nicholas Donofrio, formerly ESD's second-ranking executive, vice president for development. Rumors of a Lowe departure have swirled for more than a year; IBM watcher William F. Zachmann of Canopus Research expressed surprise but noted that Lowe's exit was just "one of a list of defections," adding, "IBM's entire PC strategy is in trouble. If Bill Lowe had been the winner he was supposed to be, and if IBM's PS/2 strategy was what it was supposed to be, he wouldn't be leaving." This is the fourth departure among IBM's senior PC executives during the past year.

R:base for PM Coming

Microrim's SQL Data Base Manager to Target Enterprise-Wide Data Sharing

Microrim reportedly is building a relational data base manager that runs under OS/2 Presentation Manager (PM) and includes SQL support for distributed processing across multivendor platforms throughout an enterprise. Code-named *Atlas II* and scheduled for second-half release, the software will be positioned as an alternative to the Microsoft/Ashton-Tate *SQL Server* and similar products, keeping Microrim competitive in a hotly contested market sought by the industry's largest and best-financed companies. *Atlas II*, released initially for the Presentation Manager and the Macintosh, ultimately aims to give users access to data whether it resides on a mini, a mainframe, or another workstation across the office or across the country. Data access will be transparent to users, whose workstations may run either the entire data base system or only front-end tools like a report writer and query generator. The PM and Mac interfaces help make this ambitious application more intuitive; for example, *Atlas II* reportedly performs data base design tasks, such as field layout and format, based on users' point-and-shoot design of forms and reports.

Ashton-Tate Sues Fox

Who Owns dBASE Language?

Ashton-Tate has filed suit against Fox Software, claiming the *Foxbase+* line copies the look and feel of *dBASE* products and that Fox should be prevented from releasing its new *dBASE IV* workalike. The suit, which is unlikely to come to trial before mid-1990, seeks "millions of dollars" in damages, says Ashton-Tate general counsel Stan Witkow. President Ed Esber claims that Fox and The Santa Cruz Operation, which sells a Xenix version of *Foxbase+*, violated Ashton-Tate's legal rights by copying the total concept and feel of *dBASE III Plus*—including the screens and menus, the dBASE language, and the way *dBASE* interacts with the user. Ashton-Tate seeks to have its ownership of the *dBASE* language affirmed, despite original developer Wayne Ratliff's adoption of 40 of the program's 260 commands from public domain software. Fox president Dave Fulton insists that no one can own a language, that the code of his C language program is entirely original, and that his company has been showing the code to Ashton-Tate since January 1984. He claims Ashton-Tate made a "multimillion-dollar offer" to acquire his 50-person company in early 1987, at which time he showed Ashton-Tate programmers his product's source code and answered hours of questions about it. He points out that his company has changed the *Foxbase+* interface to conform to its Mac version and that it runs six times faster than *dBASE IV*. Fulton also affirms that Ashton-Tate is simply trying "to hurt Fox financially, trying to establish a monopoly and acting in restraint of trade." Witkow retorts that look and feel also includes a product's "sequence structure, organization, and language." *dBASE* consultant and author Adam Green scoffs at the suit, suggesting that Ashton-Tate will need *dBASE* add-ons to help buoy the *dBASE* standard in the face of upcoming competition from well-heeled vendors like Lotus Development and Microsoft.

Traveling Software Prepares New Data Manager

Memory-Resident Data Manager Lets You Organize, Access Files of Various Applications

Any day now, Traveling Software will release a data management and search program that differs significantly from both traditional data managers and the new personal information managers (PIMs). "Call it an information access manager," suggests Traveling president Mark Eppley. Code-named *Papillon*, the program lets users do conditional search and retrieval of existing data stored in diverse file formats, in different subdirectories, across multiple hard drives, from within their favorite applications. The memory-resident pop-up treats files as "items" and a cluster of related items—such as a subdirectory—as a "view." Newly created items can be linked automatically by user-designated parameters such as file extension or text string. During a search, *Papillon* automatically loads and unloads the application needed to read each file, so that a collection of items from different applications can be assembled, read, and printed without the user having to change data formats or create a duplicate in *Papillon*'s format. The product has been tested on more than 100 of the most popular packages and uses a clipboard for data transport between them. Eppley doesn't consider *Papillon* to be an application, but rather a "metalayer" that sits between the operating system and its applications. The program, which should retail for about $139, will require only 50K or so of memory.

SideKick for PM Bundled

IBM Blesses First Presentation Manager Application

Borland International's *SideKick for Presentation Manager*, the first PM application to find its way into customers' hands, is arriving free with every copy of OS/2 Standard and Extended Editions shipped by IBM. The bundling arrangement lasts at least through February 15 and may be extended, says a Borland spokesperson. Borland also plans to release the $250 product to retailers by the end of March, about the time other system vendors expect to offer PM. *SideKick for PM* includes the same collection of applications found in Borland's character-based *SideKick Plus* but exploits both Borland's *Paradox* data base engine and OS/2 to provide multiuser/multitasking capabilities. Applications include a notepad, a calculator with editable tapes whose formulas can be changed and saved, a phone book, and a time planner. The phone book and time planner enlist the full relational powers of the *Paradox* engine to create and search schedules and phone lists; the resulting reports can be personalized using *SideKick*'s object-oriented drawing package. The user can view schedules by day, week, month, and year, organizing appointments in categories and attaching PM icons to differentiate entries as meetings, vacations, and so on. Thanks to OS/2, the user can work on multiple applications simultaneously and transfer information between them via the PM clipboard.

User Group Association Gets Bulletin Board

User Umbrella Group Taps BIT to Connect Far-Flung Members

Three major vendors will underwrite the establishment of an electronic bulletin board to link all 77 affiliate groups of the Association of PC User Groups (APCUG), representing more than 100,000 individual members. Financed by Borland International, Intel Personal Computer Enhancement Operation (PCEO), and Tymnet, the BIT bulletin board will be run by Borland salespeople at its Scotts Valley, California, headquarters as part of Borland's $100,000 annual user group commitment. User group officers will have local phone access in 780 cities via the Tymnet public data network. Intel PCEO is contributing more than $50,000 worth of Connection CoProcessor communications enhancement boards, equipped with the Hayes-compatible modem option for phone links, binary file transfer, and facsimile transmission. APCUG members will be able to exchange newsletters, access a monthly commentary from industry leaders, and conduct on-line conferences with their peers. One of the first items on the agenda, says APCUG board member Steve Bass, is to arrange an organization-wide election of board members, who currently are volunteers. APCUG is an international nonprofit organization designed to facilitate communication within the user group community and to enhance both user support activities and member influence in product planning.

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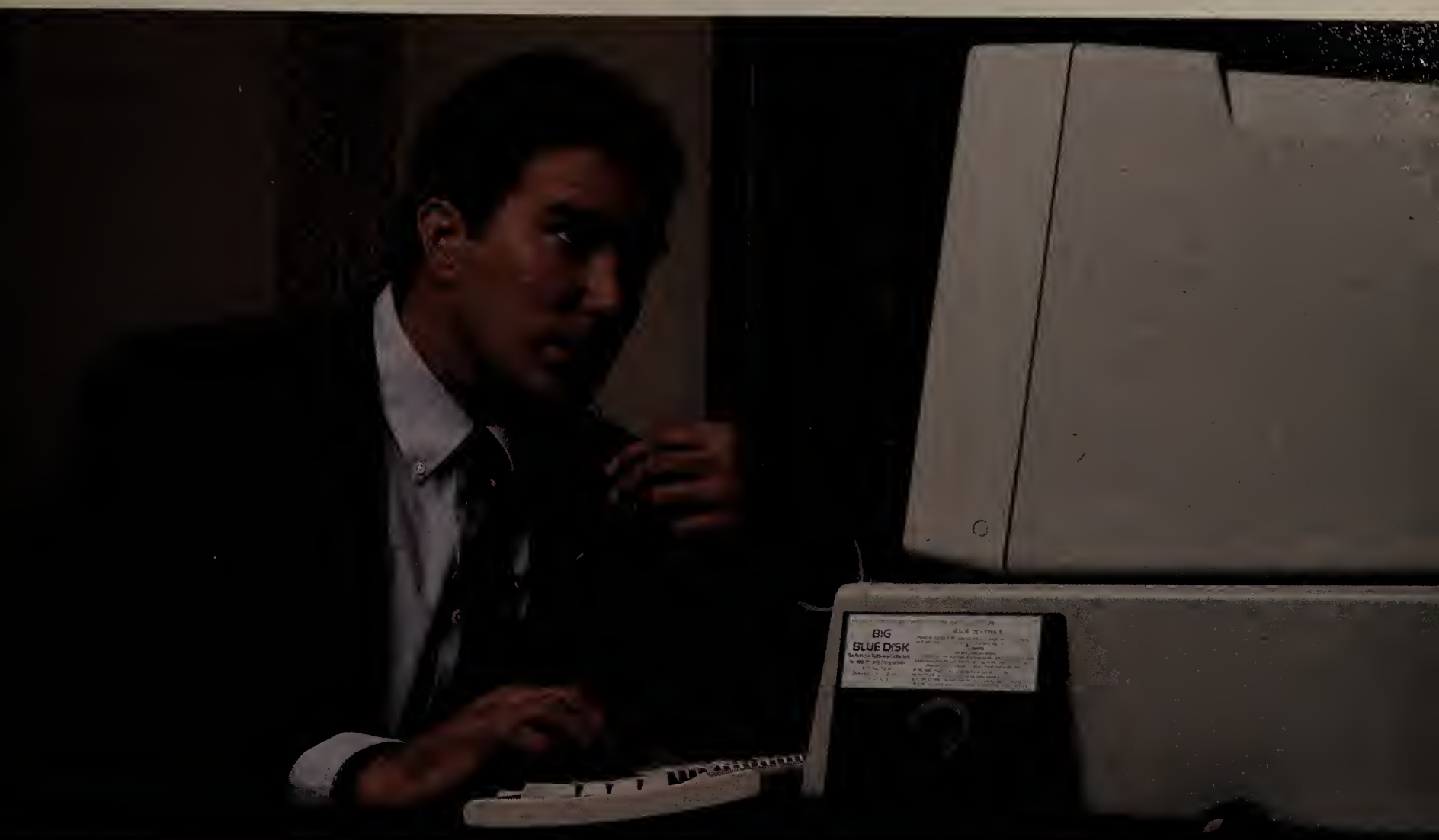

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Graphics Group Formed

WPMA Seeks Standardization Among Windows and OS/2 Presentation Manager Products

A group of some 70 software developers, system makers, and large corporate users have formed a nonprofit organization to accelerate the acceptance of *Microsoft Windows* and IBM OS/2 Presentation Manager. Lead by longtime *Windows* developer Micrografx, the Windows Presentation Manager Association (WPMA) hopes to promote these similar graphic user interface products as standards and to ensure consistent operation among their applications through meetings, a newsletter, and an electronic bulletin board. Microsoft Corporation is one of 20 software developers involved, but as of this writing, IBM had not yet been convinced to join. Micrografx chairperson George Grayson recognizes the irony in that, joking that "we will drag them kicking and screaming across the finish line." WPMA is interested in having "a voice, not veto power" over the development direction of *Windows* and Presentation Manager. Historically, market leaders such as IBM have not been anxious to open product design up to discussion or to loosen their grip on a standard. But recently, some of IBM's control in the bus area has been weakened by the challenge from the Extended Industry Standard Architecture (EISA) coalition. Similarly, the Video Electronics Standards Association, led by NEC Home Electronics, has broken away to create an 800 by 600 enhanced VGA standard.

Bye-Bye Boom?

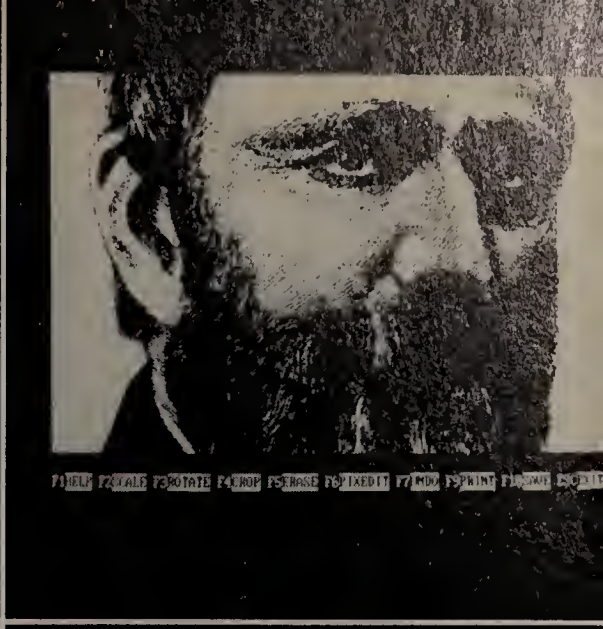
While Some Markets Will Prosper, Industry Growth Expected to Slow This Year

PC component vendors and analysts anticipate that after several years of heady expansion, sales growth will slow in 1989. Overall unit sales, which rose by 84 percent in 1987 and 23.5 percent in 1988, will climb only about 10 percent in 1989, according to Bruce Stephen, analyst for International Data Corporation. "The boom days are over," predicts Stephen. "We've had a lot of gushers, but a 10 percent growth rate isn't bad; it's steadier, more realistic, and appropriate for a more mature industry." The industry simply couldn't be expected to maintain its pace, he says. Additionally, multiple unit buyers (who account for about 60 percent of PC shipments) are lengthening purchase cycles in order to come to grips with the extensive technology changes now under way. "People are thinking more strategically about where they put their dollars, and streamlining existing systems through connectivity products," Stephen notes. "There's a cautious attitude toward new technology—386s and new buses and OS/2. People are studying more before they go out and buy, because a lot of the pieces are not yet available." Bright spots amid the general slowdown are portable computers and PCs sold into the work-at-home market. Additionally, revenues are expected to grow by 15 percent because of the shift to 80386 processors. Intel Corporation, which concurs with the 10 percent unit growth number, expects to be shipping as many 80386 chips as 80286 chips by midyear. By 1990, says Intel marketing manager John Fitzpatrick, his company's unit shipments will be split evenly between 80286s, 80386s, and the new 80386SXs.

Lotus Bundles Impress

Ships Second Enhancement Product to Combat Excel

Overseas, Lotus Development is bundling a new screen- and output-enhancement product with *1-2-3*. *Impress* by PC Publishing is being shipped with copies of the spreadsheet in Europe. For the past several months, U.S. shipments have included a similar product, *Allways* by Funk Software. Both bundles aim to neutralize competition from Microsoft's graphics-oriented spreadsheet, *Excel*. Chris Randall, marketing director for Lotus's PC Spreadsheet Division, says that Funk's U.S. marketing profile and wider selection of printer drivers make *Allways* the best choice here. On the other hand, he adds, the $149 *Impress* is more appropriate for Europeans, who are more accustomed to what-you-see-is-what-you-get graphics. *Impress* offers WYSIWYG font and color enhancements within a worksheet display, rather than simply for previewing output as with the $150 *Allways*. Additionally, says Randall, *Impress* got the nod in Europe because its French parent, Aleph 2, knows that market, and had foreign language versions immediately available. Lotus plans no changes in the U.S. bundle. Both deals represent powerful marketing coups for these longtime suppliers of *1-2-3* add-ins. ●



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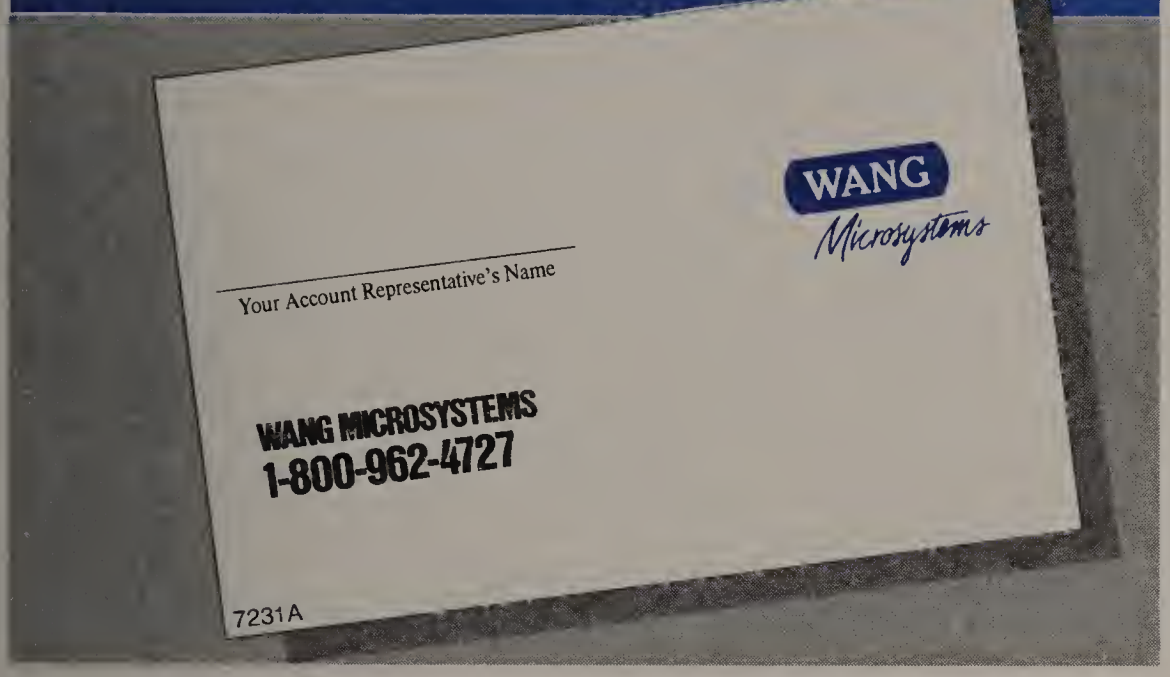

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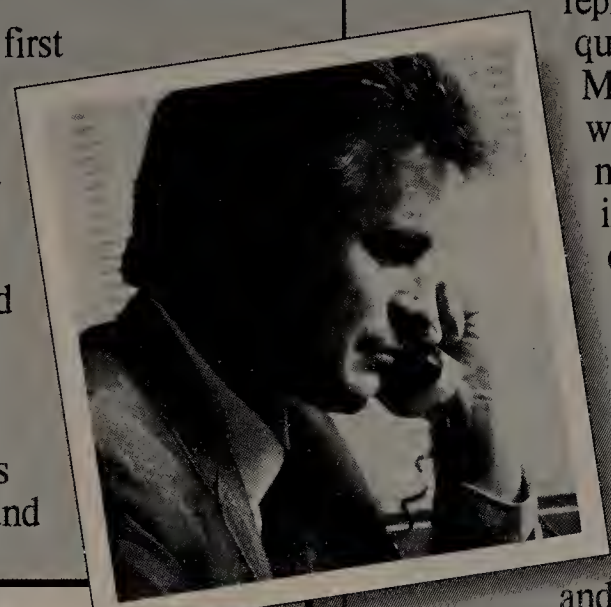

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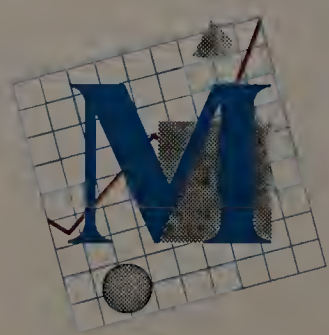

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Who Sets the Standards?

It's no longer just IBM's game.

A new crop of leaders wants to set the hardware and software standards of the future.

Richard Landry

FRED STIMSON

Until Compaq, Hewlett-Packard, and others confronted IBM in the PC bus arena with EISA, it seemed as though nobody could set a standard that differed from Big Blue's. Now the game has changed, and a host of vendors are challenging IBM's right to map out the future of PCs.

Why is this so important? Standards affect everything, from the price you pay for hardware and software to the amount of time you spend learning to use them. But standards also let you know where PCs are headed.

Take IBM's Micro Channel. It's as much a vision of the future as it is a replacement for the AT standard. The small form factor, surface-mount board design, VGA graphics, and bus-master capability all define a high-performance world that most users don't live in today. It's an exclusive world in other ways, too: built for IBM loyalists and closed to the rest of us.

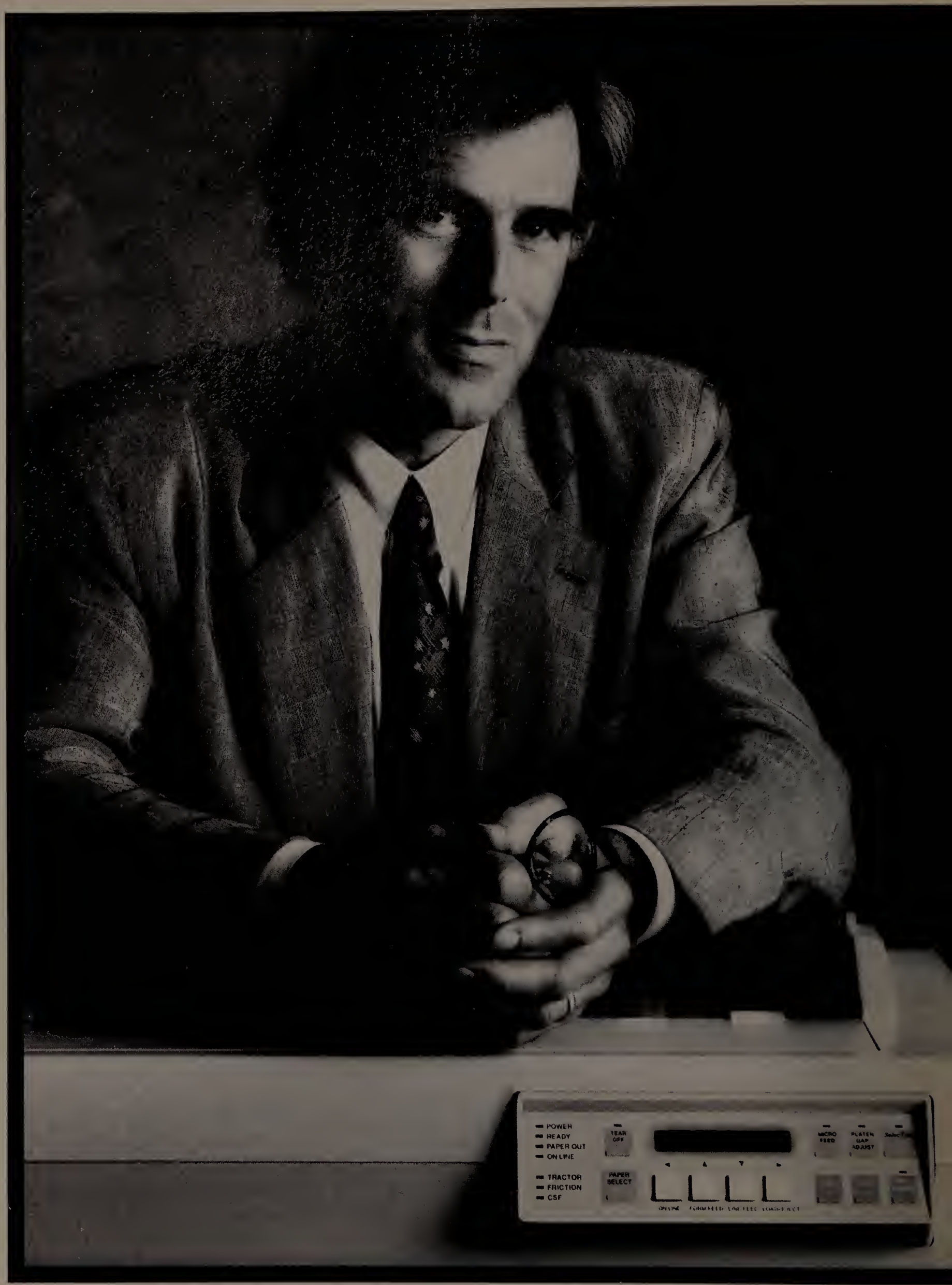
EISA represents a somewhat different vision. While its benefits (like the Micro Channel's) are all in the future, EISA lets users maintain current standards and multiple sources for new equipment. That means lower prices on retail shelves. EISA amounts to a sound business decision for vendors, too. Micro Channel systems are designed to compete with the AT-class machines vendors successfully sell today. By contrast, EISA systems are the AT's natural extension. That means greater incentive for vendors to provide high-performance PCs that complement AT systems, not render them obsolete.

As the recent flight of top executives from IBM confirms, EISA's backers have at least one thing right: PC users won't buy a vision that locks them in to a single vendor or drives up costs without providing an alternative. IBM established freedom of choice as a principle with the PC and the AT. Once the proverbial barn doors open, the inhabitants don't readily wander back.

This same story is being repeated in areas like graphics, where the next-generation vision embodied in the Micro Channel is crumbling before aggressive competitors bent on establishing standards that others will want to follow.

NEC Home Electronics is a case in point. This winter NEC announced the formation of the Video Electronic Standards Association (VESA) to support extensions to IBM's VGA graphics standard (see *Industry Outlook* in this issue). Even though other

(continues)



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vendors have pushed the 644 by 480 VGA standard to display graphics at 800 by 600 and 1024 by 768, IBM has not added such extensions to its VGA.

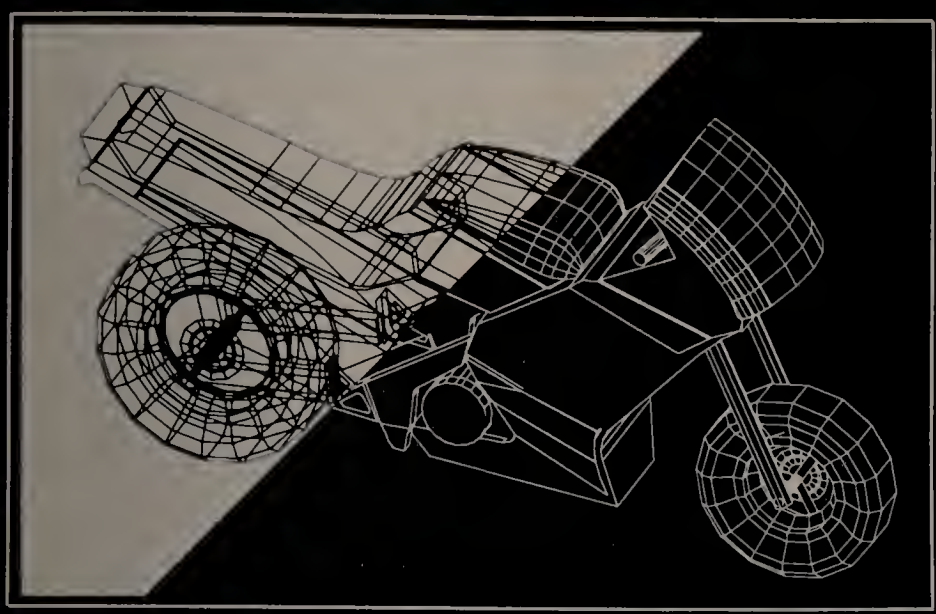
VESA members want to accelerate the move to higher resolution graphics for a fraction of the cost required to follow IBM's alternative, the 8514/A. Meanwhile, NEC is taking advantage of its leadership position by offering two new monitors designed to support the VGA's higher resolutions. Does NEC worry that clone vendors will cut into its own action? Not according to Jerry Benson, NEC's vice president for marketing. "Our only advantage is a design lead," he says. Technical innovation and consumerist thinking are what keep NEC ahead of the pack.

IBM's bitter experience in hardware applies equally well to other aspects of the PC world. While Ashton-Tate chases down Fox Software in a tussle over the future of the dBASE language, competitors on all sides are making *dBASE* itself obsolete. Powerful, easy-to-use SQL data bases threaten Ashton-Tate far more than a competitor whose products have proven enormously valuable to *dBASE* developers. Ashton-Tate would do well to trade as much technology as possible with Fox, in the hope of getting the performance edge it needs to keep the *real* competition—Microsoft, Lotus, Borland, and Oracle—at bay.

As Traveling Software's Mark Eppley puts it: "Innovate, don't litigate."

As always, I'm interested in your opinions on this or any other subject. Write to me at *PC World*, 501 Second St., San Francisco, CA 94107, or send an MCI message to Richard Landry/301-3685. ●

AW . . .WHAT THE HECK!



The first question asked by many people is, "Why is *DesignCAD 3-D* priced so low?" The answer? After developing *DesignCAD 3-D* we were unable to decide how the product should be priced. We consulted experts. We used the finest spreadsheets on the market. We took employee polls. We asked our lawyers and accountants for their opinion. We even asked our Mothers, Wives, and childhood Sweethearts! Finally in the greatest American Tradition, we said, *"Aw . . . What the Heck! Let's see the other guys beat this price!"* *DesignCAD 3-D* sells for $299 complete. No add-ons, nothing else to buy!

DesignCAD 3-D is a complete 3-Dimensional CAD system. It offers most, if not all, the features found on programs costing more than $3000! In fact, **PC Magazine** says, "For a low-cost, self-contained 3-D package DesignCAD's range of features steals the show. The package offers more than adequate features for a wide range of professionals and hobbyists alike."

Once again, American Small Business Computers has proved that you don't have to spend a lot of money to get quality software. *DesignCAD 3-D* provides features such as Shading, Solid Object Modeling, Hidden Line Removal, Cross Sectioning capability, ability to output shaded drawings to laser printers, dot-matrix printers, or pen plotters, extensive file transfer capability, *all for only $299!* No other 3-Dimensional CAD system can come close to providing the price/performance of *DesignCAD 3-D.*

There is a very important reason to buy *DesignCAD 3-D* other than price: PERFORMANCE! *DesignCAD 3-D* provides complete 3-Dimensional drawing capabilities. It's not a "warmed-over" 2-D program. *DesignCAD 3-D* allows you to draw any entity in 3-D space. This means, for example, that you can draw a curve in the shape of a spring. You can draw a circle or arc at ANY angle on ANY plane.

DesignCAD 3-D allows up to 4 simultaneous views - any angle or perspective -on the screen. *DesignCAD 3-D* also provides complex extrusions—linear, scalar, and circular. Extensive 3-D text capabilities and auto-dimensioning are provided, *at no extra charge, of course!*

DesignCAD 3-D almost certainly is compatible with the computer system you now own. *DesignCAD 3-D* supports more than 200 dot-matrix printers, at high resolution. *DesignCAD 3-D* supports more than 80 plotters, and most digitizers, mice, and graphics adapters available for "PC and PC Compatible" systems. Shaded and wireframe models can be output to the printer or plotter YOU own.

$299

DesignCAD 3-D provides the capability to read drawings from most other CAD systems (*DesignCAD/ProDesign II, AutoCAD's DXF, Hewlett Packard's HPGL,* and *IGES*). *DesignCAD 3-D* will also write GE, and POSTSCRIPT files. This file exchange utility is included at no extra charge, of course.

DesignCAD 3-D does not require expensive graphics adapters and monitors - even shading can be done on ordinary displays, such as the Enhanced Graphics Adapter (EGA), Color Graphics Adapter (CGA) and Hercules Monochrome Adapter. *DesignCAD* also supports many of the ultra high resolution graphics adapters, with more hardware being supported daily.

However, the best reason to buy *DesignCAD 3-D* is not the low price. It's not the outstanding performance. It's not the extensive hardware compatibility. *The best reason to buy DesignCAD 3-D is for its amazing ease of use!*

What else do you need to know about DesignCAD 3-D? Only this: "Included at No Extra Charge." What is included at no extra charge? **EVERYTHING! $299 BUYS IT ALL!**

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EXPANSION SLOTS: Eight full-length slots: two 8-bit, five 16-bit, one 32-bit.

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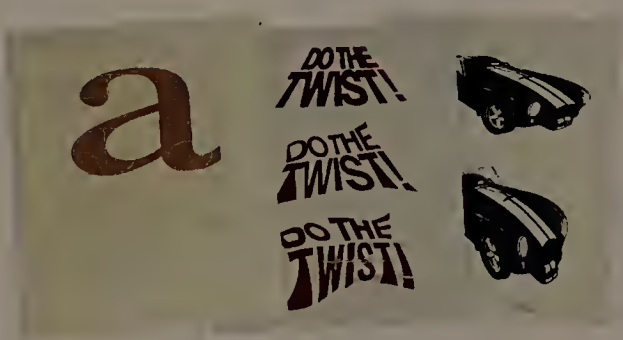

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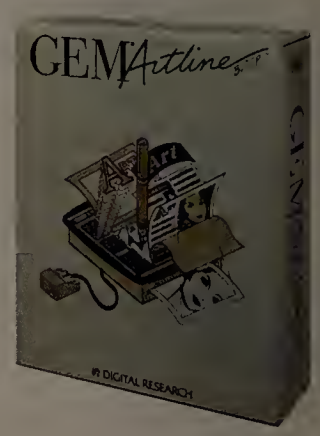

For more information, contact your nearest dealer or call (800) 443-4200.

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LETTERS

Reactions and responses from the PC World community

User Group Power Overrated

I read David Bunnell's September 1988 column ["Taking It to the Streets"] with joy in my heart and tears in my eyes. Here is a church ministering to the needs of its neighborhood. I wonder how many more such centers could be started if the people who made their riches in the computer field would contribute a fraction of their net worth, or even of their annual salary. I'm thinking specifically of the presidents and/or founders of companies like IBM, DEC, Dell, Apple, Lotus, Microsoft, Borland, and so on. And the sooner the better: As the U.S. Bureau of the Census recently reminded us, the rich are getting richer, and the poor, poorer.

As to the source of software popularity, I arrived at a different conclusion than did Stewart Alsop ["The Importance of Being Earnest," *PCW*, September 1988]. I say it's the computer press that most influences software sales, not vendor appearances at user group meetings. Take, for example, September's *Industry Outlook*. *Symphony* and *Framework* are in the headlines again, despite Steven A. Blumenthal's admission on page 198 of the same issue [*The Software Shelf*] that *Enable* is superior to *Symphony* (and cheaper, by the way). And what about excellent programs like *The Smart Series?* User groups may be important, but those of us who live more than 40 miles from one must rely on magazines and retailers for our information.

Christopher L. Komline
Gladstone, New Jersey

Co/Session Critique Unfair

In Judy Getts' review of *Co/Session* ["Remote Assistance," *PCW*, October 1988], she describes two of the program's features—password protection of the voice-to-data switch, and drive and directory file access restriction—as "pointless." Both are security features our customers have requested. *Co/Session* is the only package of its kind that allows DOS file functions to take place in the background on the host computer, and these two features are required to prevent unauthorized access to specified directories when *Co/Session* is operating in the background.

The author says our program offers faster-than-average speed —except in graphics mode. But running side by side with *Carbon Copy* and *Close Up*, *Co/Session* definitely has faster screen updates in both text and graphics modes, and we offer a money-back guarantee to any registered *Co/Session* owner who disagrees.

Finally, *Co/Session* receives no credit for many features it contains, even though other programs in the review are lauded

(continues)

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for similar capabilities. Specifically, either the host or the remote computer can call the other; users may toggle between voice and data transmission; and the program offers optional password protection and auto-callback, file transfer restrictions, and screen and session recording. Additionally, *Session/XL*, a $225 companion product, offers a powerful communications script language.

David J. Saphier
President
Triton Technologies, Inc.
Iselin, New Jersey

Despite Mr. Saphier's protestations, I still question the usefulness of the program's voice-to-data password. In most Co/Session *applications, the user will be free to skip out to DOS on the remote PC and thereby thwart any security, enjoying unlimited access to the contents of the machine's drives and directories.*

I mentioned many of Co/Session*'s capabilities in the article's Features Evaluation. I was unable to list some of* Co/Session*'s other features because of space restrictions. Likewise, other flaws in the program went unmentioned for the same reason.*
—Judy Getts

Apples Versus Oranges

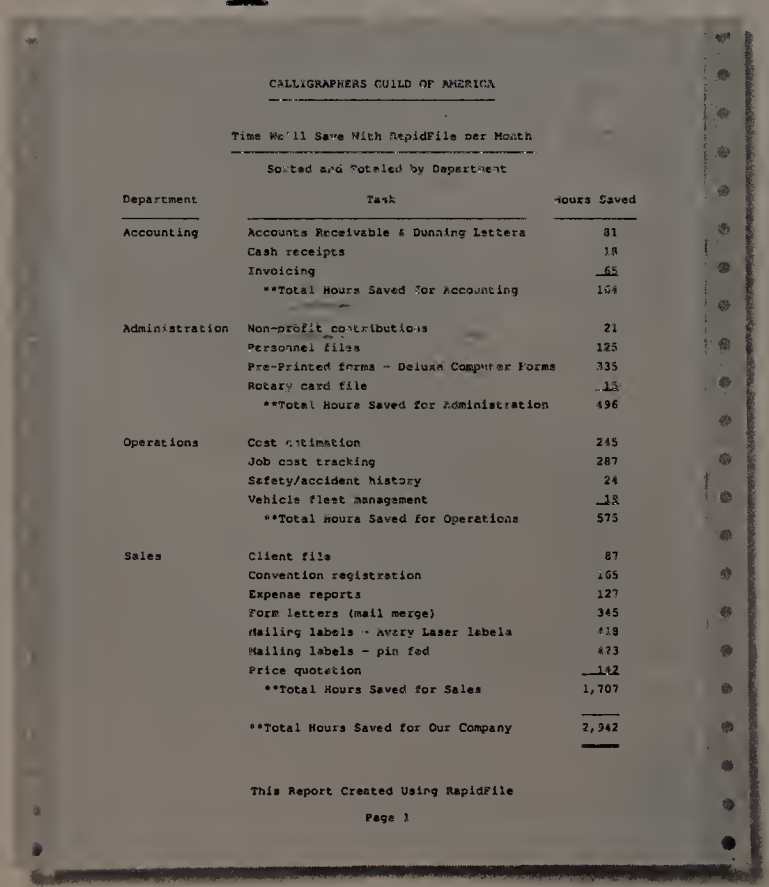
"Accounting Software: Good for Business" by *PC World* accounting expert Ralph Soucie [September 1988] was informative but had one major deficiency. Comparing Computer Associates' *Accpac BPI* to *Solomon III* and *RealWorld* is like comparing an IBM XT to Compaq's 25-MHz 386 or ALR's FlexCache. Although many readers may know that IBM also makes 80386-based machines, they are less likely to know of Computer Associates' powerful *Accpac Plus* products. Unlike the intentionally "skimpy" *BPI* line, *Accpac Plus* is superior to *Solomon III* and *RealWorld* at a comparable ($695) list price.

Joseph M. Sweet, CPA
Warwick, Rhode Island

Is PC World a Bully?

It is a rare occasion (in fact, this is the first) that I take the time to write a letter defending a reviewed product. But after reading Senior Editor Eric Knorr's

Rapid lists. Rapid labels.



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	Personnel files	125
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	Rotary card file	15
	**Total Hours Saved for Administration	496
Operations	Cost estimation	245
	Job cost tracking	287
	Safety/accident history	24
	Vehicle fleet management	18
	**Total Hours Saved for Operations	575
Sales	Client file	87
	Convention registration	165
	Expense reports	127
	Form letters (mail merge)	345
	Mailing labels - Avery Laser labels	418
	Mailing labels - pin fed	423
	Price quotation	142
	**Total Hours Saved for Sales	1,707
	**Total Hours Saved for Our Company	2,942

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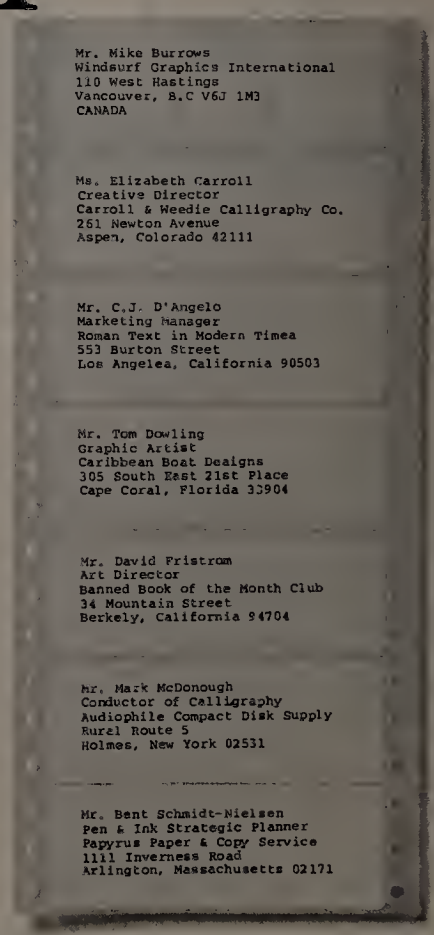

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comparison of the Dell 310 and the ALR FlexCache 20386 [*The Hardware Shelf, PCW*, September 1988], I couldn't resist.

InfoWorld and *PC Week* reviews of the 20386 earlier this year each complimented the computer's sturdy case and excellent overall workmanship. But Mr. Knorr's comment, "knock into the FlexCache with your swivel chair, and you could conceivably crash the hard disk!" smacks of a witch-hunt. The same could be said of his criticism of the "glossy paper" indicator panel. The FlexCache I own has a plastic laminate indicator panel. And as far as compatibility is concerned, I have yet to encounter a problem running Novell's *Netware*, Concurrent DOS 386, *WordPerfect 5.0*, *DesignCAD 3D*, and many other programs.

Roy J. Dew
Mineral Ridge, Ohio

The inner chassis of the FlexCache 20386 we reviewed flopped around enough that a hard disk crash would in fact be possible if the unit were bumped hard enough. As I mentioned in the review, the second unit I saw also had a poorly mounted inner chassis, although it was not as shaky as the first.

The point of my criticisms—including those concerning the loose faceplate, the hacksawed power switch, the CPU daughterboard, the compatibility problems with Windows/386, *and the shaky construction—was not to start a witch-hunt but to show that this system was rushed to market. The FlexCache 20386 is not the only system that looks like a rush job, but the unit we reviewed was a particularly glaring example.*
—Eric Knorr

Just Draw a Picture of It

What Joan Hope calls "jargon" in user manuals ["Plain English, Please," *Another Angle, PCW*, November 1988] is something people in her field (English literature) are equally guilty of. She seems to prefer the "see Spot run" school of connect-the-dots manuals; but by throwing up her hands in the face of "computer gibberish," she has chosen to limit her understanding of her

(continues)

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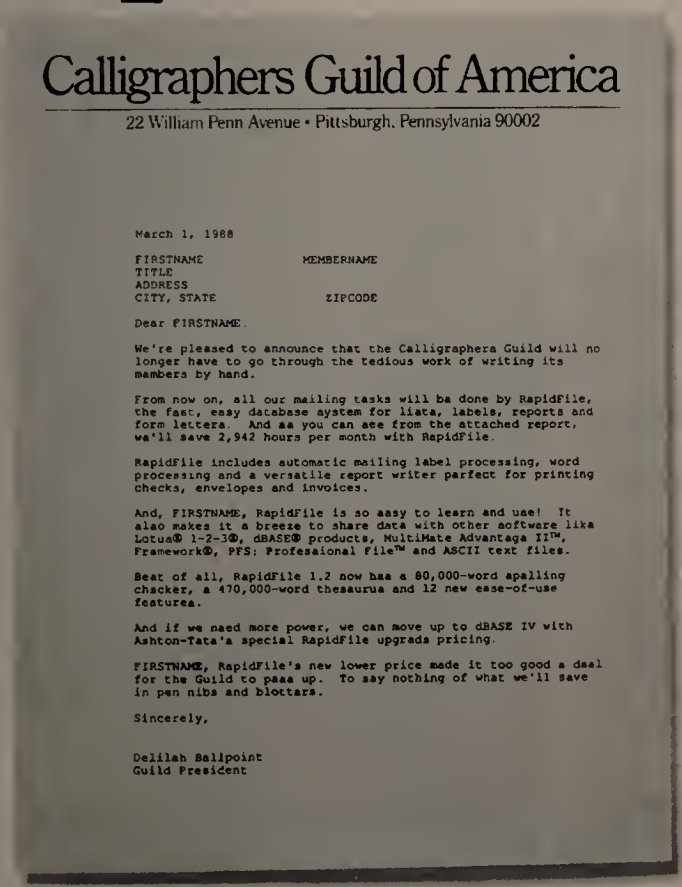
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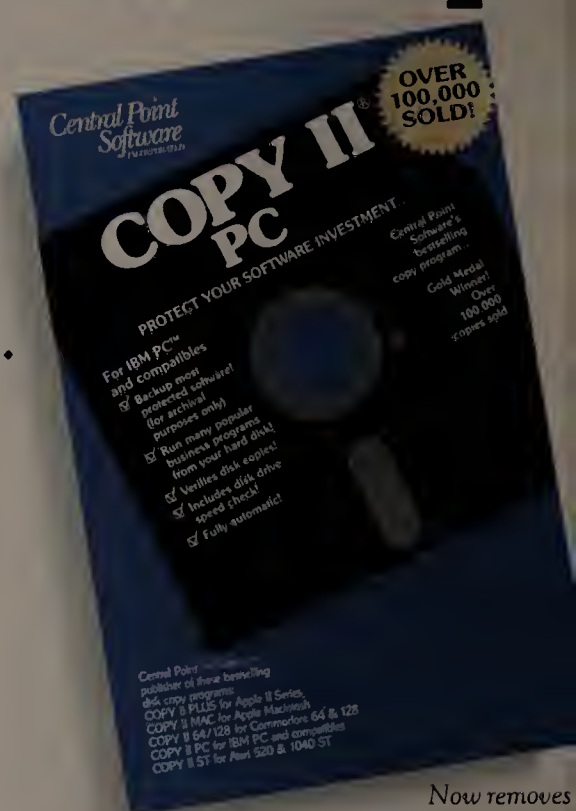

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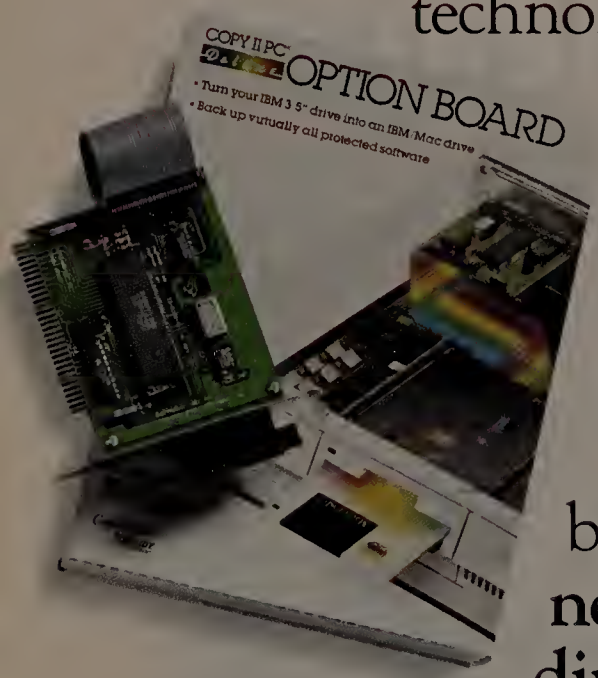

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Expansion Slots: 16-bit	—	6	6	4	4
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computer and its operations.

This notwithstanding, Ms. Hope ventures into programming, expecting her GW BASIC manual to be written down to her novice level. The sentence "GW BASIC...provides sophisticated string handling, structured programming features, and improved graphics" is nearly indecipherable for her. But how many writers and speakers of English understand such grammar-speak as, "A pronoun used as an appositive is in the same case as the word with which it is in apposition"?

Bob Brody
Los Angeles, California

The Trick to Kicking SideKick

In his review of the GridCase 1520 [*The Hardware Shelf, PCW*, September 1988], John Diebold states that *SideKick* can't be removed from the machine's memory. It took me several tries to get the sequence right, but it can be done.

The program's manual tells you to hold down <Ctrl>, then press <Home> and <End>. On the GridCase, however, you must hold down <Ctrl>, press <Function/Home>, then release it and press <End>. This maneuver removes *SideKick* from my GridCase 1520 every time.

Jim McKenney
Rowley, Massachusetts

It's About Time for an Update

I was impressed with my first copy of *PC World*, February 1988, and found two articles especially helpful. First, George Beinhorn's "WordPerfect Macro Organizer" helped me create custom on-screen menus for total macro control. "Return to Sender" in *Star-Dot-Star* gave me a *WordPerfect* macro for addressing envelopes.

Now that I've moved to *WordPerfect 5.0*, however, I am unable to get these tips to work. Would you consider printing updated versions? Thanks for providing

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Check "User Group Tips" in this month's How To *section for a* WordPerfect 5.0 *envelope-printing macro. For an update on custom menu creation in* 5.0, *see next month's* Help Screen. *— Ed.*

Corrections

"Quadruple Floppy Storage" (*The Upgrade Path, PCW,* October 1988) contained a few inaccuracies. The Mitsubishi MF-355B (not MS 355B) has a suggested retail price of $137 (not $79), and Mitsubishi doesn't offer technical support. The company sells the drive only through authorized distributors, who are responsible for offering technical support. To find the distributor nearest to you, call Mitsubishi's customer service department at 213/217-5732.

In the Features Evaluation that graced our review of *Interleaf Publisher* (*The Software Shelf, PCW,* December 1988), we incorrectly identified the product as version 1.0. It was actually version 3.0. *PC World* regrets these errors.

To send correspondence or to submit material for publication in this column, please see How to Contact PC World, page 4.

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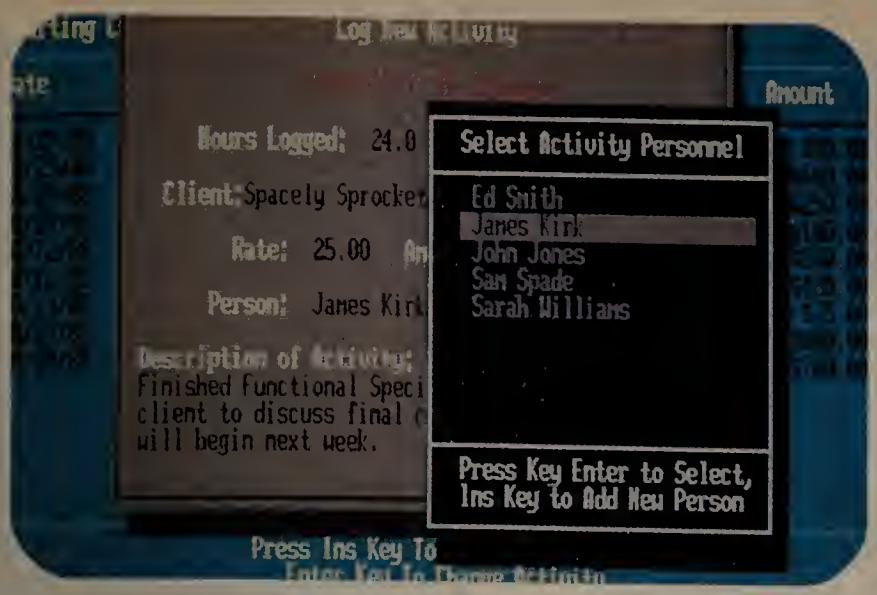

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Waste Not, Want Not

Can you honestly say you're using all of the computer power on your desk?

I vote for thinking before spending.

David Bunnell

FRED STIMSON

Whether we like it or not, the personal computer industry constantly pushes new products on us. I can understand the business incentive for this, but average users are becoming increasingly skeptical of these new developments and claims and often have little use for them.

The reality is that most of us are just scratching the surface of the computer power on our desks. Unless you're a power user, your spreadsheet, data base, and word processor have the capability to enhance your work in ways you probably haven't even imagined. A variety of consumer surveys confirm that many people don't use most of their applications' advanced features. In fact, users are often unaware of these much-touted features. Few people know how to customize their interface, much less write keyboard macros or take full advantage of DOS commands. And yet industry players and observers have us believing we need 386 machines with OS/2 software and Micro Channel Architecture.

I recently discussed this problem with Lee Felsenstein, a world-famous hacker if there ever was one. He thinks that the role of hackers has evolved from being the first to use new technology to working to extend the life of existing computers. This bodes well for all of us. There are millions of PCs in the world already, and it would be tremendously wasteful if old 8086 and 8088 machines were banished to overburdened landfills just because something sexier has come along.

At the recent COMDEX computer show in Las Vegas, I took part in a panel discussion where one of the speakers claimed computers were getting easier to use—that within five years we'd approach them as mindlessly as we do a light switch. I can't sing the praises of computers quite so easily! True advances in user interface technology and programming are simplifying some aspects of computing. But today's applications present us with an avalanche of options and capabilities that actually make computers more complex and harder to use. Along with that complexity, however, comes the potential to do so many more things with our PCs.

The fact is, computers are getting harder to use for good

(continues)

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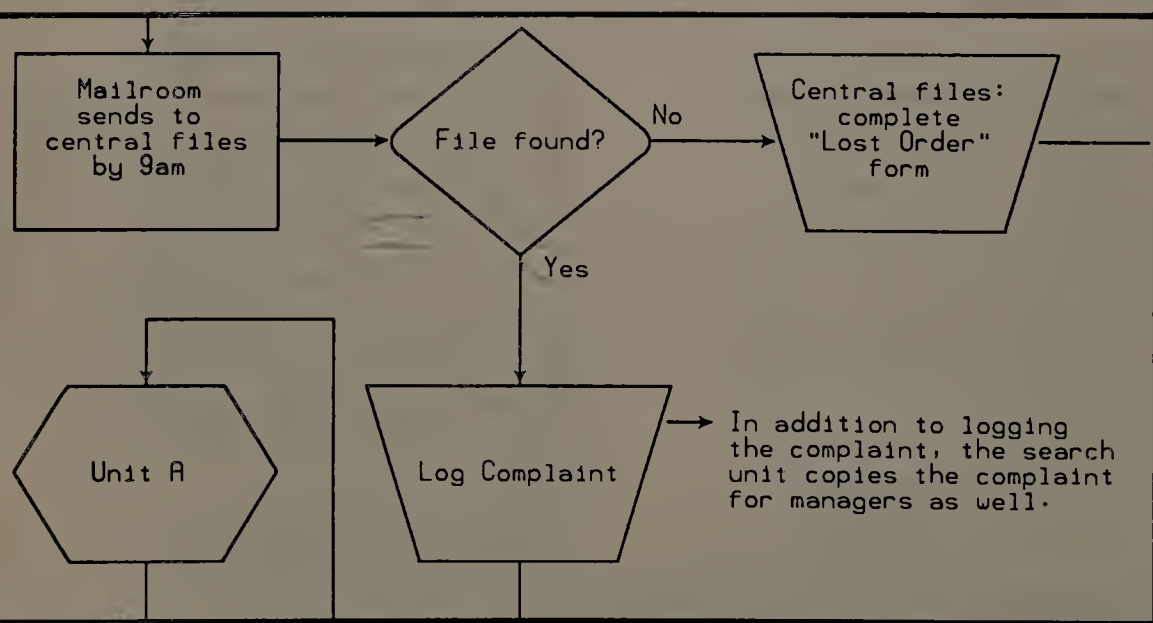

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reasons. There probably isn't a single reader of *PC World* who couldn't get more out of the PC and the software he or she already has. So ask yourself these questions the next time a purchasing decision comes up: Instead of replacing my AT with a 386, would I be better off investing in some PC training courses? Instead of getting OS/2, should I buy some videotapes and books to improve my skills with the applications I already use? Before you buy something new, be sure you've gotten the maximum out of what you already have. When it comes to computing, let us run—not walk—away from conspicuous consumption. The price in energy, time, and money is too high. ●

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WordPerfect Corporation
Orem, Utah

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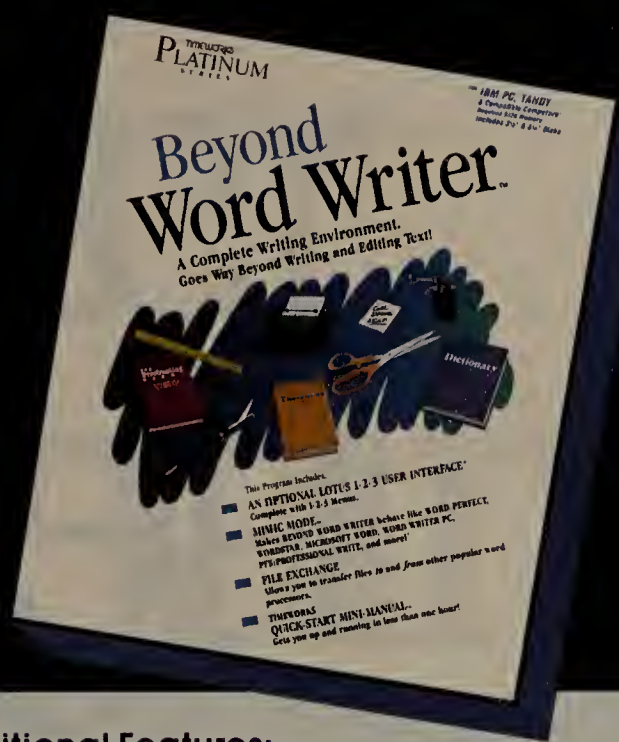

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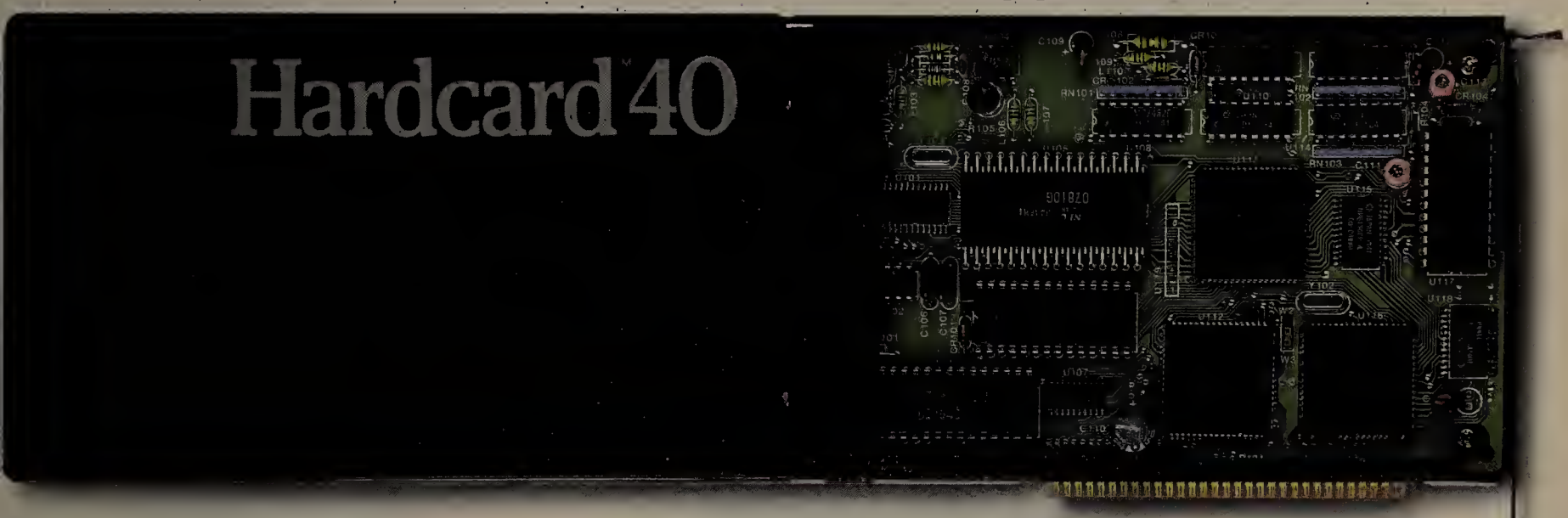

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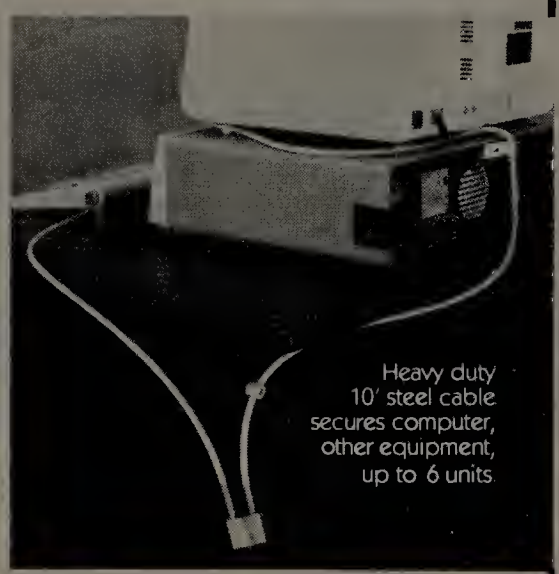

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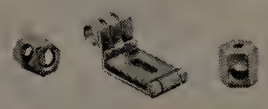

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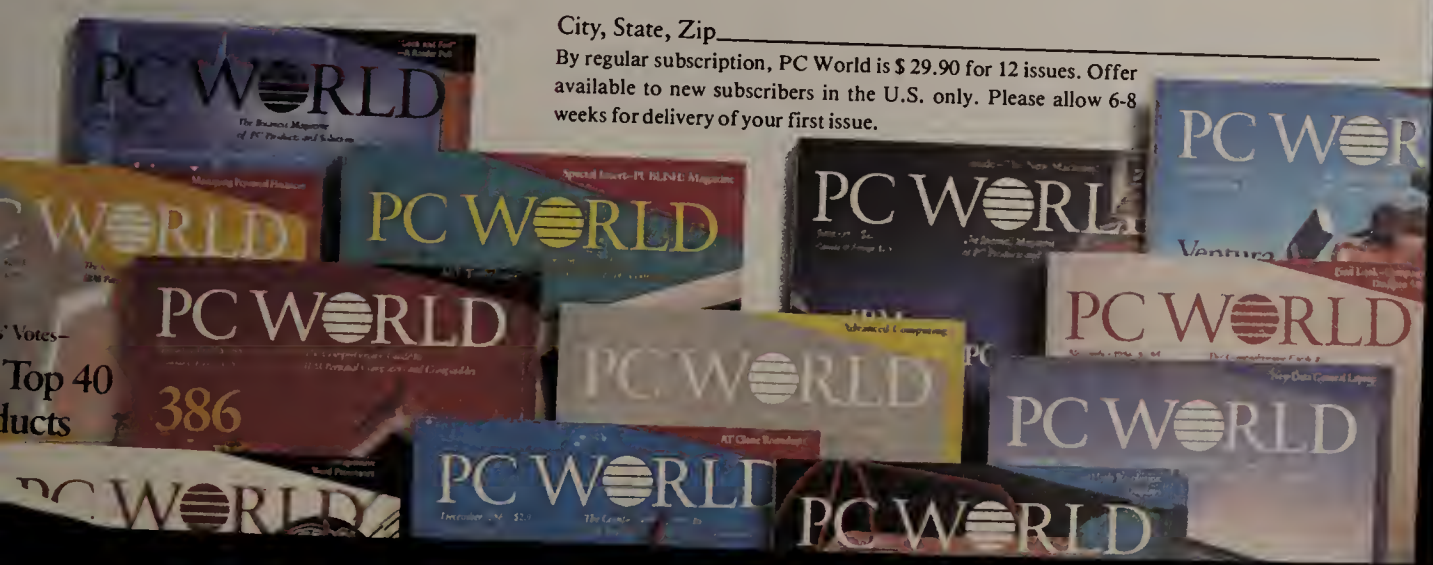

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Stewart Alsop

FRED STIMSON

Bill Dunn is the guy in charge of Dow Jones Information Services, the electronic arm of the company that publishes the *Wall Street Journal* and *Barron's*, among other things. People who run on-line data services tend to be pretty gray and uninteresting, but Bill Dunn is an exception, someone worth paying attention to.

The reason? Bill Dunn has a vision that data (which is what Dow Jones sells) doesn't have to be a dead, remote commodity, and that you shouldn't have to log on to some arcane system to get access to it. In Dunn's vision you sit down at your computer and tell it what kinds of things you're interested in; the computer then feeds you data and uses the latest graphics technology to present it the way you're used to seeing it in everyday life. In Dunn's vision, the *Wall Street Journal* would be constantly displayed on your screen (or fed to your laser printer at regular intervals, if you want). This *Journal* would look very much like the one you see on the newsstand, only it would carry stories—news, features, editorials, columns, and stock tables—of particular interest to you, which you could interact with if you wanted more information.

Say that on February 7, IBM announces an extended family of PS/3 computers. When I come back from lunch, my computer displays the front page of my *Wall Street Journal* with the left column featuring a summary of the product introduction. The News in Brief column shows a list of stories relating to other computer news, plus several marketing stories that match my usual interests. The middle-column story (known as the A-header) is a general profile on IBM that the *Journal* ran two months earlier but is clearly good background for the lead news story. The Business Bulletins column carries a summary of published market statistics on personal computers for the last two years. The righthand column is still carrying the profile of the Japanese auto industry that the computer had picked out for me earlier that morning.

I read the story about the IBM product introduction, scan the briefs, and then double-click on a market-share chart in the Bulletins column. A dialog box asks what I would like; I ask if there's been a geographic shift in IBM's market share in the past

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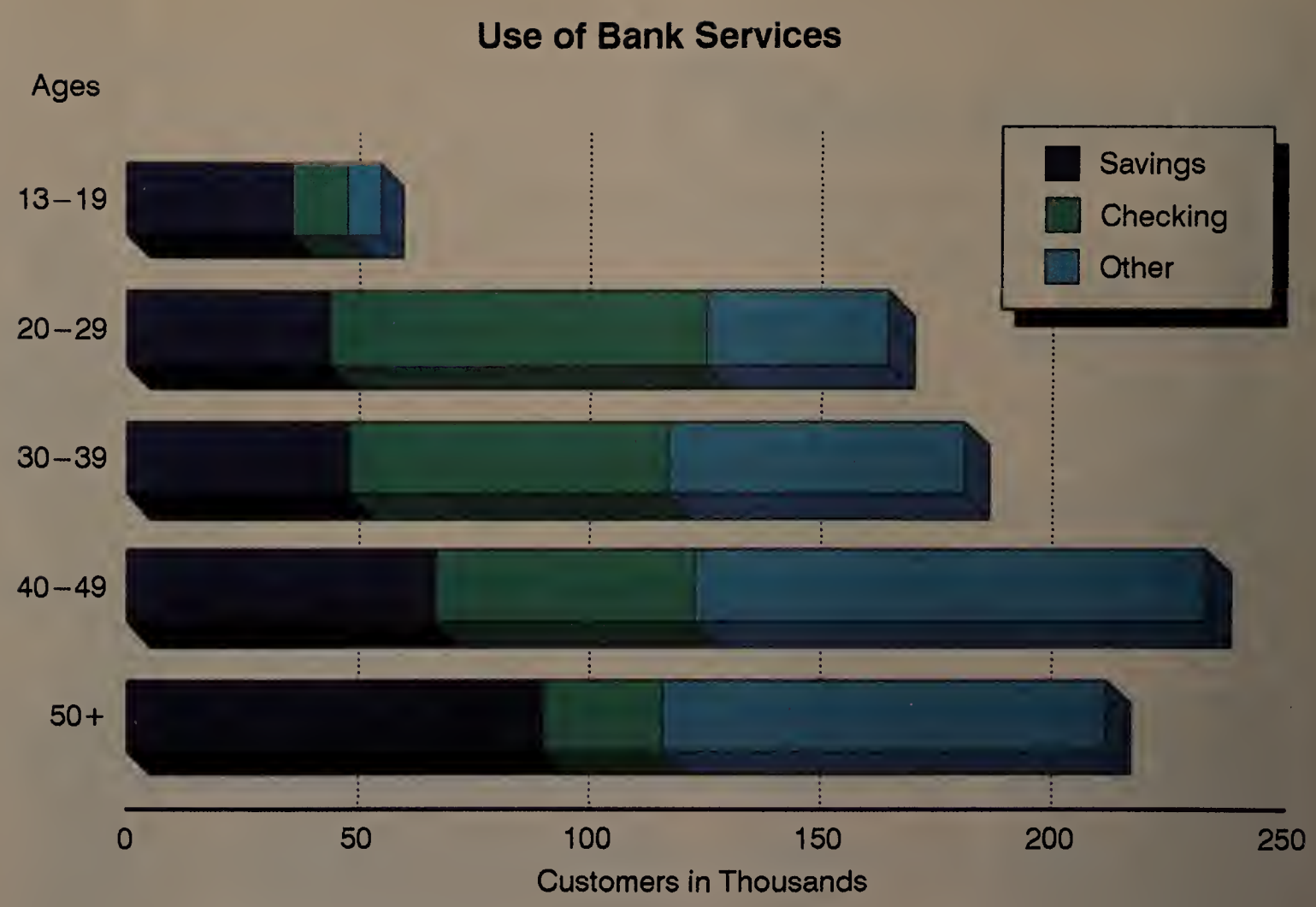

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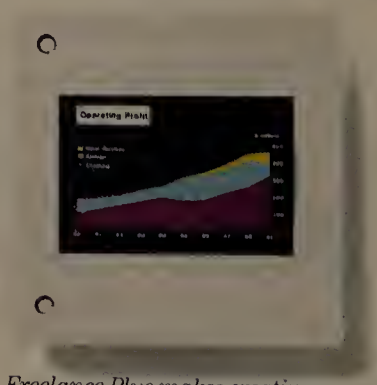

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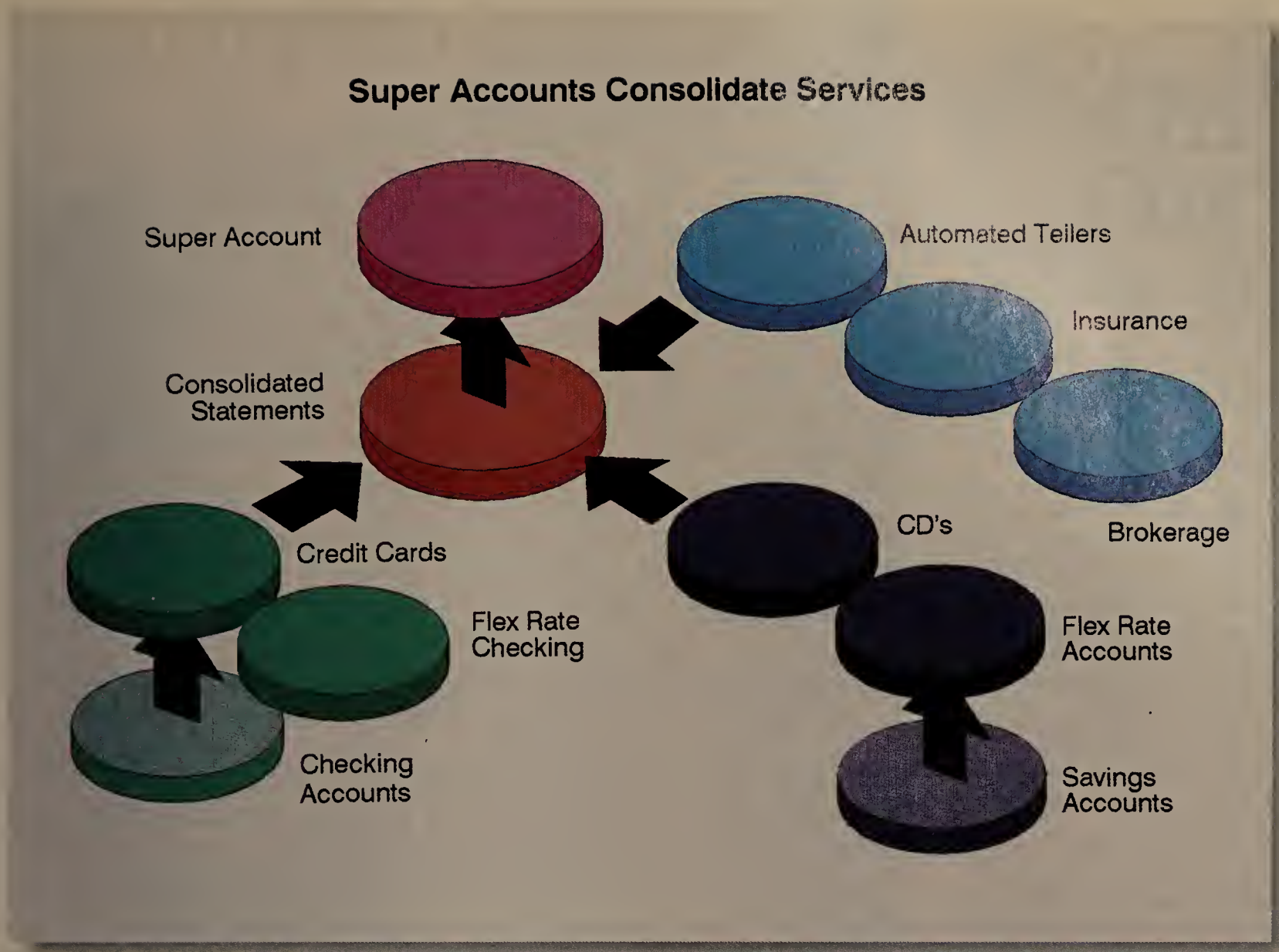

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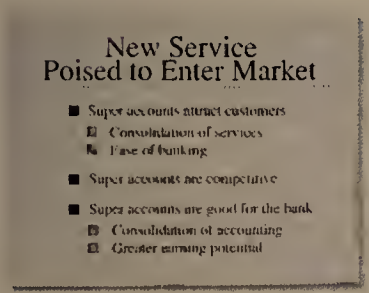

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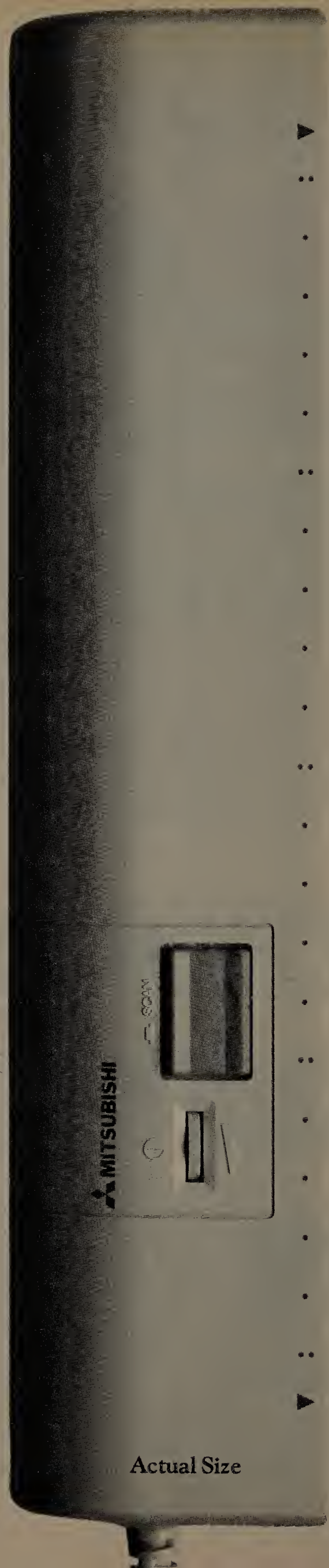
The scanner, model SP-MH216AF, can scan an 8½" x 11" page in 10 seconds, independently or with its optional automatic paperfeeder, model SP-MH01FA, shown above.



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Circle 317 on reader service card

five years. The computer comes back, instantly, with another chart showing how IBM's primary market has shifted from the United States to Europe, where the company is now selling more than half of its PC products.

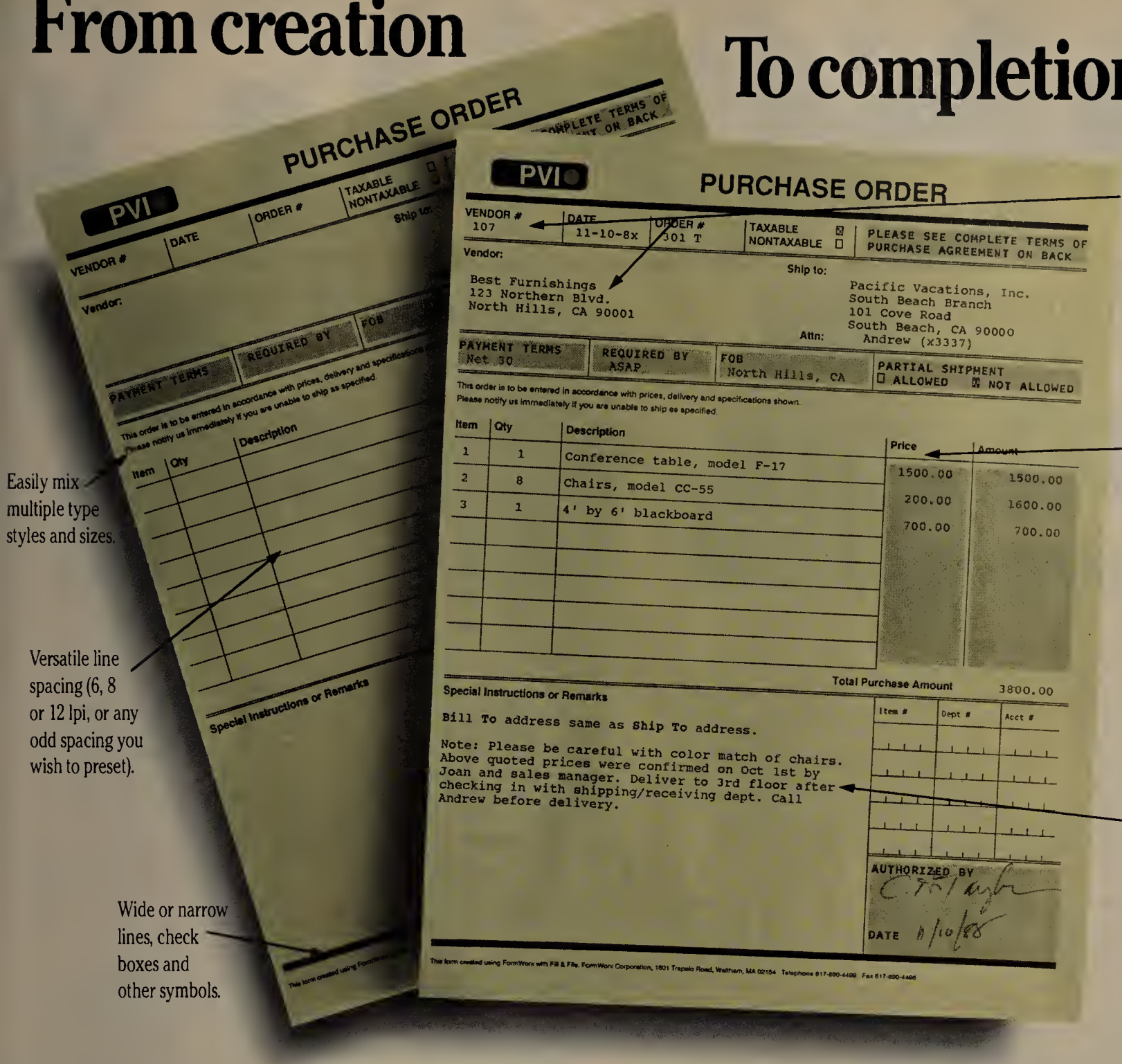
How much of this is fantasy? Not much. Three developments are making this dream possible, and Bill Dunn's company is aggressively investing in all three areas: imaging models, parallel processing, and high-speed digital networks.

Imaging models is fancy, state-of-the-art jargon for the way the computer displays stuff on your screen and prints it out. With the arrival of high-resolution bit-mapped displays (like VGA monitors and monochrome page displays) and higher resolution laser printers, computer designers have realized that showing something on the screen and then printing it out on paper is the same basic process. This leads to what Steve Jobs calls the single-imaging model: a single method for software to describe things for the screen, printers, and even facsimile machines. The idea of displaying the front page of the *Wall Street Journal* in a way that does real justice to the printed version is no longer crazy.

Parallel processing is another fancy term for computers—particularly the big ones—that can use many different processors at once instead of just one at a time. Bill Dunn has bought a computer called the Connection Machine, one of the first parallel processing systems, so he can process customer requests phrased in English. This is the

(continues)

From creation To completion...



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part of the technology that would let me ask about IBM's shifting market share and get what looks like an instant response.

And *digital networks* are the latest technology for making very fast, very broad connections between remote computers, instead of relying on the old copper lines of the telephone company. The telephone companies themselves are in the process of replacing the entire U.S. telephone network with something called ISDN (Integrated Services Digital Network) so that all of us can use this technology. But Bill Dunn is impatient, so Dow Jones has been installing its own digital network, which is currently available in 12 major U.S. cities.

The combination of these technologies (and the general trend toward less expensive, more powerful computers) means that within the next year or so, you will be able to play out the scenario I just described without more than a second's delay in response time. And when that happens, suddenly you're not going to worry so much about how fast your spreadsheet recalculates or your data base sorts. You will begin to worry about entirely new things, like how to find information that's important to you and your job. In some ways, that's a much more exciting revolution than any brought about by fancy software. ●

Stewart Alsop is editor and publisher of P.C. Letter *and a contributing editor for* PC World.

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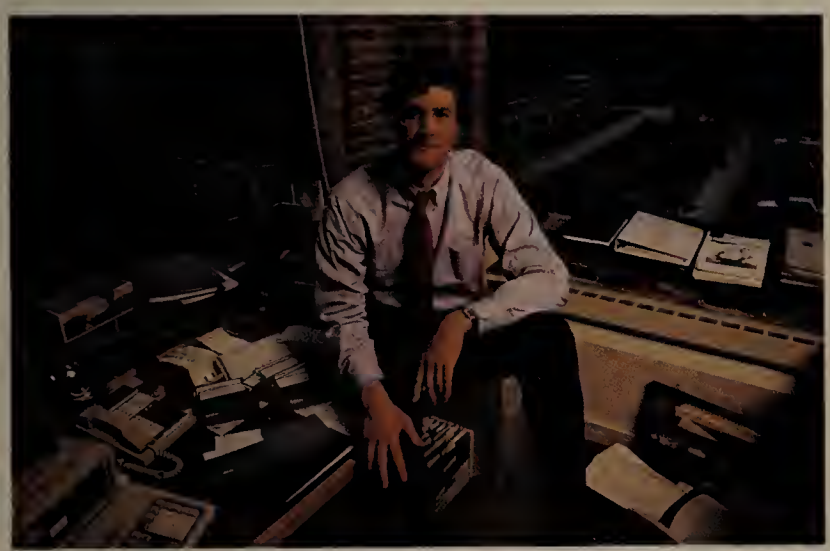
Edited by ERIC BENDER

Technical Talent Still Key to Success

Software Houses Go on the Block

Good News/Bad News for Consumers



Acquisitions are "very difficult to do and do well," comments Lotus Development's David Tarrant.

RICHARD HOWARD

Even veteran PC software houses are usually small businesses—a fraction the size of many hardware suppliers whose names were unfamiliar a year ago. But increasingly, small firms find themselves up against the giants—as one executive remarks, "Microsoft is everywhere, and it's like a B-1 bomber with the bomb bays open."

Even profitable software houses find their pockets are never deep enough: The sales group wants expensive marketing campaigns, customers are crying for more features as well as OS/2 and Macintosh versions of programs, and venture capitalists are eager to cash out.

As a result, many firms are constantly on the lookout for a big partner, and from time to time, deals go down. But how well do acquisitions serve the customers?

"They tend to be good news," says David Tarrant, vice president of Lotus's Graphics, Text and Information Management division. Tarrant notes, however, that acquisitions are "very difficult to do and do well."

As with other marriages, there are plenty of good, bad, and mixed tales to tell. The purchaser intends to pump in money and marketing resources and to make special efforts to keep key employees. But the acquired firm usually loses its top managers and experiences massive culture shock. Disappearing technical talent is more crucial to customers, though, because such losses often cause major delays in product rollouts and reduce the quality of support.

Acquisitions have created classic bloody-footprints-in-the-snow stories, like Ashton-Tate's 1985 purchase of Multimate. The word processor supplier's top executive quite literally sailed away, customer support suffered, and development went into a spin that dropped *MultiMate* from the front ranks. The story did take a happier turn when Ashton-Tate finally brought out a major upgrade in 1987—"I've never seen a product so improved," one user reports—although the Multimate technology is out of the company's mainstream.

At the other extreme ("an anomaly," in Tarrant's words) was Lotus's 1986 buyout of Graphic Communications Inc. Employing 55, GCI was braced for big competition in presentation graphics and began negotiations with Lotus soon after launching the *1-2-3*–flavored *Freelance*. "It was an opportunity to secure the future for our employees and our customers," cofounder Tarrant explains. "We decided we'd probably never find a better fit."

(continues)

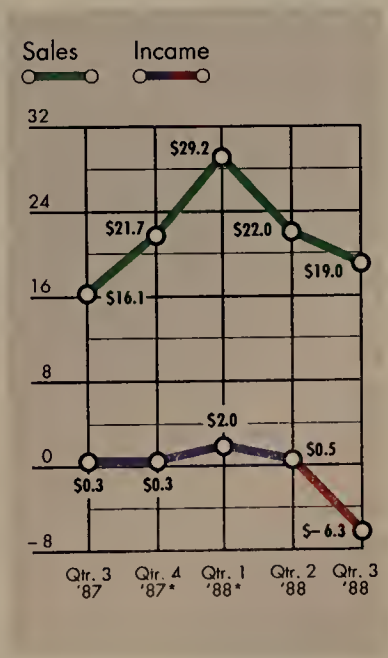
Borland Restructures

Goes Outside for Executive Talent

Bursting into one software market after another, six-year-old Borland International was approaching $100 million in annual sales as it opened its grand new headquarters in Scotts Valley, California, last July. But by late summer the firm was on the defensive, laying off 100 U.S. employees in August and 20 French workers soon after, and posting not only

(continues on page 66)

Borland Stumbles
(in millions of dollars)



Trying to grab market share in numerous arenas, Borland International boasted overall sales but ran into red ink. Figures estimated for calendar years.

*Borland went public in London; results figured according to U.K. accounting practices.

Software

(continued)

GCI was located only half an hour's drive from Lotus headquarters, so employees weren't uprooted. "In software engineering and development, quality assurance, and documentation, 100 percent of the people are still here," Tarrant says. Did customer support improve or decline? "That's probably a wash," Tarrant replies. He adds, though, that when *Freelance* sales soared, "Lotus already had an infrastructure in place to handle thousands of calls a day."

Like GCI, Innovative Software was profitable and growing when it merged with data base supplier Informix Software last year. "We didn't have a market squeeze," says Ron Ferguson, vice president for marketing at Informix. However, "we were competing with much larger competitors capable of providing a much larger array of products and services."

Innovative, which offers the integrated *Smart* series, was based in Lenexa, Kansas; Informix in Menlo Park, California. That didn't change. "We've maintained two separate headquarters and really dissimilar development teams," Ferguson says. The group will build *Smart* links to Informix back ends but will also support Informix's competitors. Meanwhile, he says, customer service has been unaffected.

Software Publishing's acquisitions have not always been pain-free for all concerned; it laid off five-sixths of the staff when it bought Harvard Software. But last September's purchase of Office Solutions "is definitely a win-win situation," says Jan Eddy, former chief executive of the word processing firm.

Founded in 1982, Office Solutions had 60 employees, and at that size "you get lost in no-man's-land," Eddy remarks. "The revenue gap between second-tier companies and first-tier companies is mind-boggling. Our goals were always to grow 50 percent or more a year, but that became increasingly difficult. We were competing with the three largest PC software firms—not to mention IBM and Wang.

"Software Publishing is a much more well-capitalized company; its resources were infinite compared to what we had," Eddy says. Office Solutions, in turn, offered its high-end *OfficeWriter* and a sizable installed base in corporate America. Software Publishing's goals "required a strong foothold in one of the three main categories, and in word processing the market is still open for growth." Moreover, she says, both product lines stress ease of use.

The acquisition did create some confusion. Some *OfficeWriter* customers had signed site licenses, for example, and "it takes a little extra effort to make sure that the contractual arrangements are being passed on to the right person." But both development and product support remain at the Madison, Wisconsin, site rather than being transferred to the parent's Mountain View, California, headquarters.

While acquisitions are common, a company like Lotus that gets hundreds of proposals annually goes through "an extremely selective process," Tarrant points out. The process isn't getting any less picky, either; software candidates must play nicely within an ever-more-complex set of applications and standards. "Two years ago products fell off the plate because they were dumb ideas; now sometimes they fall off the plate because of integration issues," Tarrant says. Sometimes, in fact, Lotus prefers to see unfinished products.

Of course, a buyout is hardly the only beneficial relationship to pursue. Ashton-Tate recently followed a common practice in the home-software industry by forming a division to publish third-party applications. "It's another label that allows us to innovate," says president Luther Nussbaum. "If products catch on, we'll migrate them into the main product line."

Meanwhile, Personal Computer Support Group (PCSG) and Dac Software, both of Dallas, solved their resource problems by commingling their respective talents without merging the companies—Dac markets and distributes products developed by the PCSG team. "Life is tough in that under-$10 million category," says Dac president Kevin Howe, "but I think this methodology could save a lot of small companies from being acquired."
—*E. B.*

NEC Aims to Establish Extended-VGA Standard

New Resolution for New Year

Among IBM's efforts to recast personal computing with PS/2s, the Video Graphics Array (VGA) represents the first take-no-prisoners triumph. Providing up to 640-by-480-pixel resolution and up to 256 colors out of a 262,144-color palette, the VGA and its accompanying analog monitors were quickly adopted by system vendors and board manufacturers alike. By Dataquest estimates, around 2.5 million VGA boards were delivered last year. "The vendors are saying VGA, VGA, VGA," remarks Chris Cockill, monitor marketing manager at Amdek in San Jose, California.

Although scrambling to build VGA products, board manufacturers didn't forget to add a few bells and whistles. They noticed that a card with 512K of memory could just as easily produce 800 by 600 resolution with the same color choices. Also, such displays would be

(continues)

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Circle 212 on reader service card

How Private Is E-Mail?

Security Concerns Grow

When you send that confidential memo to a business partner via electronic mail, are you certain that it will be safe from prying eyes en route?

Your main line of defense is your password—if no one gets that, no one gets your mail. The biggest threat usually comes from unscrupulous fellow employees who pick up a carelessly guarded password. But how about the mail services themselves?

At four major E-mail purveyors—MCI Mail, AT&T Mail, Western Union's EasyLink, and CompuServe—customer service representatives are adamant that it's impossible for *any* service employee to access a subscriber's private mailbox. But queries among the corporate offices reveal a slightly darker picture.

"A very limited number of CompuServe programmers—about four or five—do have the ability to read subscribers' mail," says Kitty Thomas, spokesperson for CompuServe in Columbus, Ohio. "But there are a number of checks and balances involved in accessing sensitive areas of the system. If one of those safeguards was compromised we'd know about it immediately."

At AT&T Mail, "there is a small group of people who require a rather liberal amount of access to the network machines," notes Joe Bednar, supervisor in the message service department at Bell Laboratories. But while they can theoretically access user mail, audit trails of operator activity and company policy ensure that they don't, he says.

Spokespeople for MCI Mail in Washington, D.C., and Western Union of Upper Saddle River, New Jersey, are more circumspect. But they admit that if they were presented with a court order or search warrant to turn over the contents of a subscriber's mailbox, they could do so.

E-mail purveyors have a vested interest in quelling fears that correspondence may not be as private as it seems. The 1986 Electronic Communications Privacy Act makes it a crime to disclose the contents of another's private E-mail, unless the information service is presented with a court order or search warrant.

But critics like Robert Ellis Smith feel that privacy issues are plagued by unsettling questions. "I don't think these companies have consistent policies on how they're transmitting and storing information—where the mail is being stored, for how long, and in what

(continues)

RICHARD SALA

VGA

(continued)

supported—barely—by the popular multifrequency monitors led by the MultiSync family from NEC Home Electronics of Wood Dale, Illinois.

But each board manufacturer approached development differently, with different display timing schemes. That complicated the matching of boards to monitors and reduced the likelihood that application vendors would bother to write drivers.

Reenter NEC. Sales of the costly multifrequency monitors were beginning to soften, because the VGA onslaught was whittling away their advantage of working with multiple adapters. Seeing a chance to bolster market share by pulling 800 by 600 resolution into the mainstream, NEC brought together nine leading graphics card suppliers to nail down a common timing scheme, solving the mix-and-match problem and promising application developers a coherent target.

NEC didn't discuss the plan with other monitor makers before announcing it last November, along with the MultiSync 2A optimized for VGA and Extended VGA (and selling for $799, slightly above pricing of VGA monitors). But with off-the-shelf multifrequency displays from other vendors also supporting the resolution, the remaining question is how quickly application developers will write the necessary drivers. (That's not a huge task, but developers aren't craving more work either.)

Extended VGA offers a noticeable improvement over VGA, with 56 percent more pixels on the screen. Jim Schwabe, marketing director for NEC's graphics unit, expects that to pay off in word processing, desktop publishing, and general *Windows* applications.

Extended VGA would be the first widely established graphics standard outside IBM since the Hercules monochrome board. Big Blue's next step is the 8514/A, which offers 1024 by 768 resolution with the same color choices but requires much more costly boards and monitors. The 8514/A may appear soon on high-end PS/2 motherboards; "Presentation Manager is what's going to bring 8514/A into the marketplace," Schwabe predicts. —*E. B.*

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Borland

(continued from page 61)

lower sales but a $6.3 million loss in the quarter ended September 30.

The main problem, in the opinion of analysts, was lack of focus—too many packages banging heads against the market's most entrenched products.

"Borland's strategy has been to go broad, but outside of languages—and maybe even in languages—they're not number one in any category," says Rick Sherlund, vice president at Goldman Sachs. By trying to break into the major leagues with inexpensive packages, "they're essentially giving away their profits." Product quality alone can't do it, he adds: "*Quattro* is widely viewed as a better spreadsheet than *1-2-3* for less than half the price, but that may not matter if customers have standardized."

Philippe Kahn: Technology will be the edge.

Philippe Kahn, Borland's outspoken 36-year-old founder and chief executive, acknowledges management mistakes but says that the company decided to postpone profits to build market share. The $6.3 million quarterly loss, he says, is a one-time event. He declares that sales have been strong ever since and denies rumors of boardroom battles with director Ben Rosen. And he insists that the firm has taken the proper medicine—layoffs, a trimmed product line, reorganization, and an infusion of top executives.

"We had a growth problem; in one year we multiplied ourselves by two and a half," Kahn says. At the same time, the top level of executives turned over, with one exception. The company is now split into three main groups; marketing and sales, under Dan Crane (who formerly spearheaded Toshiba's successful march into laptops); finance and operations, under Alan Henricks; and development, under Kahn, who remains both chief executive and chief operating officer.

Kahn launched the 550-employee firm with Turbo Pascal, and he continues to take a hands-on interest in development. "Technology is the heart and soul of the company; that's the only edge we have," says Kahn. His expertise helps keep Borland neck and neck with Microsoft in language products, but success has been more checkered in applications.

The million-selling *SideKick* desktop accessory has been upgraded into the much more powerful (and expensive) *SideKick Plus*, and both are best-sellers. *Paradox*, acquired in fall 1987, is a top contender among data base managers, and Borland is aggressively pushing toward OS/2 and network versions. But while *Quattro* sold 100,000 copies in its first three months, the spreadsheet hasn't kept that pace. (An upgrade that cleans up bugs, takes less memory, and incorporates *Surpass* features like hot links is rumored for the spring.) And *Sprint*, the word processor that wears many masks, appears to have stumbled.

"With the reputation the company has built for itself, we can grow into markets through technology without blowing zillions of dollars," Kahn believes. But analysts disagree.

"Borland has a very loyal customer base," remarks Maureen Fleming, editor of the *Software Industry Bulletin* in Stamford, Connecticut. But it's hard to reach beyond the

(continues)

E-Mail

(continued)

way—and they certainly don't keep their subscribers informed of how they're handling that," says Smith, publisher of the *Privacy Journal* in Washington, D.C. He also questions whether the E-mail industry can boast a long tradition of respecting privacy.

As an extra precaution, AT&T Mail of New Brunswick, New Jersey, locks up the terminals operators use to access sensitive areas of the network. Other safeguards include encrypting passwords, auditing operator activity, and keeping personnel segregated from sensitive information.

Still, experts advise skepticism. No system, no matter how secure, is invulnerable to people and accidents, warns Richard tenEyck, telecommunications director of the Boston Computer Society.

"To gain the trust of subscribers, these services should have encryption built into their mail," tenEyck suggests. But none of them does. Bell Labs' Bednar says AT&T considered adding encryption to its E-mail network but decided that customers would probably feel more secure if they encrypted their mail themselves prior to posting it on the system.

Smith foresees the privacy debate heating up. "When there is more personal correspondence on these systems," he says, "it's going to become an acute problem." Business correspondence, he notes, may contain trade secrets, but seldom is their revelation as devastating as the contents of a billet-doux. He predicts a time when E-mail systems advertise their security virtues.

Until then, advises Sanford Sherizen, president of Data Security Systems, a computer security consultancy in Natick, Massachusetts, "my rule of thumb is that if you cannot send something on an open postcard through the U.S. mail, then you should not be sending it through E-mail." —*Judy Getts*

RENEE LYNN

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DEC Connects DOS, OS/2, Mac, and UNIX

Tandy to Produce DEC PCs

Frustrated in its effort to become a major player in PCs, giant Digital Equipment Corporation has laid down an alternate strategy: to become the force that ties together diverse desktop computers. It's a strategy that works well for $12 billion DEC in the large-computer world, where its VAX minis already connect remote mainframes and minis.

DEC began unfolding its desktop connectivity plan a year ago with the declaration that users of DOS, OS/2, Macintosh, and UNIX computers could henceforth enjoy easy access to the same services offered to VAX users: E-mail, network PostScript printing, SQL data base access, and use of *All-in-One* office automation software.

Actually, for years DEC claimed to provide PC users with "seamless" access to these services, but that was via a complex and clumsy process. Now, however, "DOS users think they're [simply] doing their DOS activities," declares John Rose, manager of DEC's Personal Computing Systems Group in Merrimack, New Hampshire.

The move into PC networking positions the VAX as a PC server (running VAX/VMS Services for DOS, which is bundled with the VAX operating system). To promote this role, last October DEC rolled out a server configuration designed for installation and operation by network novices.

DEC also gave details on joint work with Ashton-Tate to create a version of *dBASE* for the VAX, exploiting a client/server architecture in which a data base engine on the server—DEC's SQL Services—does the heavy lifting. SQL Services will provide access to data enterprise-wide, while the character-based and graphics versions of *dBASE* for the VAX will serve as multiuser data bases for work groups. Ashton-Tate also will create a PC program to let existing *dBASE* applications tap into *RDB/VMS* data bases.

To connect to the VAX, personal computers must be compatible with the DECnet network. Last year DEC hammered out agreements with Apple, Olivetti, Zenith, Compaq, and Tandy to produce DECnet-compatible versions of their machines—avoiding the hardware snags that can surface when tying onto DECnet.

Tandy won an additional plum—a contract to build PCs for DEC to resell. But Rose says the deal does not indicate DEC is moving away from support for its slow-selling VAXmate intelligent terminal. Nor is the company considering a foray into the retail sector, the site of an earlier debacle.

Instead, in late January, DEC is projected to

John Rose: DEC looks for greater net effect.

debut the Personal VAX, a single-user system priced at around $6000. Running VMS applications and supporting a *DECwindows* graphic interface, the Personal VAX is also expected to emulate an XT or an AT via software.

Overall, DEC's move into PC networking represents a change of heart, says Greg Cline, a senior analyst at Boston's Yankee Group. Cline believes that DEC must penetrate the desktop sector in order to continue its massive growth, and it can leverage two huge assets: a powerful network management system that is relatively easy to use, and the highly reliable VAX.

Rivals see weaknesses in a DEC-centric view. "To fully commit to openness is antithetical to their whole strategy," declares Dave Williams, director of product planning at Banyan Systems in Westboro, Massachusetts. "If you're a DEC shop, it's going to be attractive. If you're a multivendor shop, it won't be."

However, DEC appears increasingly ready to position its smaller VAXs against 80386-based servers from the likes of Banyan, Novell, and 3Com. Though DEC's $18,800 offering might seem a tad expensive, it comes with E-mail, windowing and network management software, and a multiuser operating system. "There's a misconception that 386 systems are much cheaper," DEC's Rose says. —*Edward Warner*

Contributing Editor Judy Getts writes on communications from Wauwatosa, Wisconsin, and Edward Warner is a freelance writer in Boston.

Borland

(continued)

converts, she says. "Word processing is a big-budget competitive situation, and so are data bases and spreadsheets. Borland is like a kid in a candy store—it's trying to get its hands on everything. Rather than focusing on one category and spending the money needed to buy market share, it skimped on all three."

"The problem in software is not what to do, it's what not to do," Kahn acknowledges. Borland's development targets have narrowed to DOS and the Presentation Manager. Given the company's ability to react quickly, its Presentation Manager packages may eventually pay off big. IBM gave its blessing to the Presentation Manager version of *SideKick* by bundling it with shipments of the operating system during the holiday season. —*E. B.* ●

SETH RESNICK

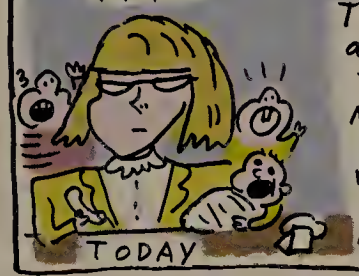
EMPLOYEES OF THE MONTH

WHERE ARE THEY NOW?

Doug "Do It Myself" Muller (Jan. '76)

Doug was the kind of guy who always had to do it himself. Had a hand in everything.

Doug laid himself off in '83.



Gladys Del Rio (June '78)

A resourceful, savvy businesswoman. Shoo-in for the Board.

These days Gladys is a shrewd, gutsy family planner. Member of the PTA; Brownie Den Mother; Women's Guild V.P.; Neighborhood Association merger in the works.

Jerry Soussa (Dec. '81)

Ace mailroom attendant. Three-time E.O.T.M.

Currently, Jerry continues his first-rate job down in the mailroom.

J B Flynn (April '86)

Young, ambitious, type A personality. Wanted it all and wanted it yesterday.

Old before his time.

Bernice Merriweather (Feb. '87)

Bernice's February work output was her best ever. In fact, February was her career peak.

Last seen at the Potatoes-Are-Us fast-food counter in the Hasbrouck Mall.

Lou Ogilvy (March '80)

All around decent sort of fellow. "Fair and Square Lou" "Mr. Nice Guy"

Finished last.

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Circle 343 on reader service card

Polishing Paradox

With Paradox 3.0, Borland shows it's serious about meeting the needs of its customers.

The new version boasts business graphics, improved query-by-example options, and advanced relational tools.

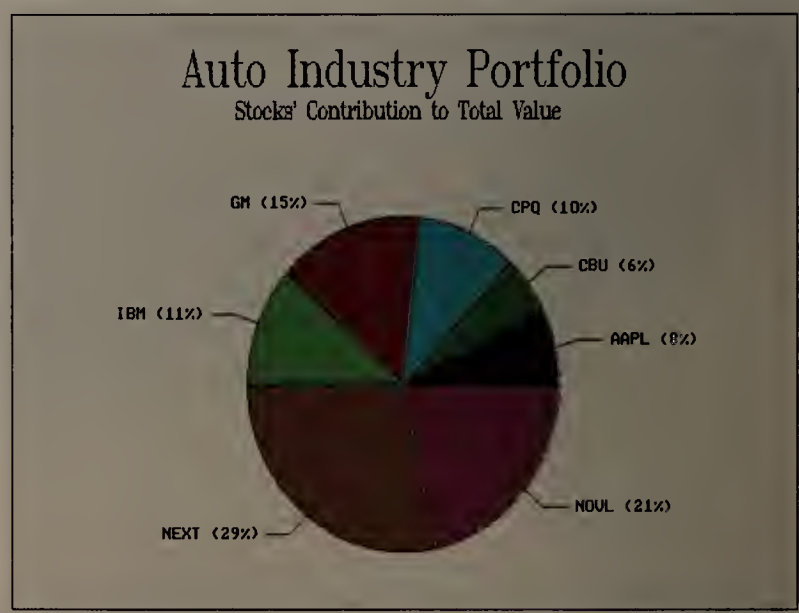
Steve King

Unlike most vendor bulletin boards, Borland's Paradox BBS offers a "wish list" conference where users can kibitz about the shape of future releases. The Paradox BBS is no idle nod to users' fantasies. According to Borland, version 3.0 of the popular relational data manager is based largely on advice from that forum, and *PC World*'s examination of *Paradox 3.0* reveals innovative solutions to common gripes and pleas.

Borland wisely retains *Paradox 2.0*'s *1-2-3*–like interface and maintains compatibility between versions for both data files and PAL (Paradox Application Language) programs. It adds major new features without sacrificing speedy performance, and the beta version we looked at was remarkably bug-free. Version 3.0 requires a hard disk but can run in 512K. It costs $725, with the upgrade priced at $125. (*Paradox 2.0* has been reduced to $495.)

The top new features include business graphics, cross-tabulation, and multitable and multirecord forms that open up many-to-many relationships between data bases. Other granted wishes include EMS 4.0 support, file conversions for *Quattro* and *Reflex*, color customization, and enhancements to PAL. The only major omission is SQL support, but Borland promises a SQL upgrade by spring.

PC World previews are informal assessments of products that at press time were still in the development stage. Complete reviews—including features evaluations and performance testing—will appear only after a product is officially released.



Built-in presentation graphics lead Paradox 3.0's feature hit parade.

Multiple Choice

Paradox 3.0's graphics capability more than justifies the cost of the upgrade. It's oriented toward quick on-screen analysis but also excels at presentation, supporting over 100 output devices. It provides ten graph types, including bar, line, pie, and area.

Designed for statistical analysis, *Paradox 3.0*'s new Crosstabs feature (borrowed from *Reflex*) will please accountants and other number crunchers. It provides a spreadsheetlike breakdown of all records that appear in a single field of a data table. You can do statistical operations such as counting, totaling, and finding maximum and minimum values, and then create reports and graphs based on the calculated data.

Paradox 3.0's most impressive advance lies in its new relational capabili-

ties. The program not only supplies the usual one-to-one and one-to-many relationships, but with its new multirecord and multitable forms, it also permits many-to-one and many-to-many links. This level of relational power is rare in the PC realm (*R:base* and *DataPerfect* being exceptions).

The multirecord forms solve a familiar problem with table views. In *Paradox 2.0*, if a table has more than a few fields, you can't see all the data in a single record at once. You have to scroll horizontally or switch to a single-record form view. With *Paradox 3.0*, you can design forms that display multiple records in a tablelike view.

Multitable forms let you simultaneously display records from multiple tables. With an unlinked table, you can display records from two or more tables at a time and quickly jump between windows. Linked tables let you establish logical relationships between the data in two or more tables on a single form.

The new multiple-choice forms can cure headaches involved with attaching several entries in one data table to a single record in another table. Say, for example, that you have a Company table with a record for each client company and a Statement table with a record for each item sold. To see a client's entire statement using *Paradox 2.0*, you have to do a multitable query separate from any data entry. With *Paradox 3.0*, you can design a multitable form that displays the client data in the heading and uses the multirecord feature to show the items the client purchased in the form's body.

Another bonus: The new relational feats extend to the report writer, so you can extract data from several tables. Instead of having to query several tables and generate the report from the resulting Answer table, you can create multitable reports with a single operation.

Crisp Queries

Query by example (QBE), new to *dBASE IV*, has always been available in *Paradox*. Instead of typing complex Boolean search terms, you can refine a search by entering an example of what you're looking for. *Paradox 3.0* offers three major new QBE tricks: outer joins, set operations, and an OR operator.

The outer join feature can help limit the number of queries you make. In *Paradox 2.0*, a multitable query looking for matching records in two or more tables won't produce results if one table doesn't provide a match—even if the others do. This inner join feature remains the default in *Paradox 3.0*, but you can now choose an outer join option that provides results even if one table doesn't produce a match.

The new set operations feature lets you work with a specified set of records. Like an outer join, set operations reduce the number of queries. With the new OR operator you can enter multiple options on a single line.

Wish List for Paradox 4.0

With *Paradox 3.0*, Borland satisfies the foremost wishes of its customers. Yet a few missing links remain, especially for PAL programmers. The program lacks directory management, the built-in editor is still weak, and the dreamed-about PAL compiler has yet to materialize.

Still, PAL programmers are not likely to abandon *Paradox*, and other users should find the upgrade well worth the price. The new version stands up well to *dBASE IV* and will probably entice many *dBASE* defectors. *Paradox*'s QBE is still the best in the business, and the graphics and multirelational tools make the program virtually irresistible. ●

SNAPSHOT

Paradox 3.0

With the latest version of its relational DBMS, Borland bolsters its easy-to-use query-by-example features and adds business graphics and many-to-one and many-to-many relational features.

KEY FEATURES

- **Built-in graphics**
- **Multitable and multirecord forms that provide many-to-one or many-to-many relationships between data bases**
- **Cross-tabulation for spreadsheetlike statistical analysis**
- **Support for EMS 4.0**
- **Quattro and Reflex conversions**

AVAILABILITY

Paradox 3.0 was scheduled for release in January 1989.

PRICING

$725; upgrade from *Paradox 2.0* $125 for registered users, $175 for non-registered users

Borland Int'l
1800 Green Hills Rd.
Scotts Valley, CA 95066
408/438-8400

For more information, circle 750 on reader service card.

Steve King is a program analyst for a California state agency. He moonlights as a writer/computer consultant and has coauthored several computer books.

The LaserJet's Sharper Image

Need better-than-newspaper-quality pictures in your newsletters, reports, and flyers?

With Intel's $695 Visual Edge, your LaserJet Series II can pull it off.

Richard Jantz

When desktop publishers need to print out scanned photos, they usually shun the LaserJet Series II—and for good reason. While many scanners can discern up to 64 different shades of gray in an image, at its very best the LaserJet can reproduce only about 19 shades. As a result, the subtle nuances of a photo are lost —the laser-printed result is dominated by harsh blacks and whites.

But with Intel Corporation's new printer enhancement package, appropriately dubbed the Visual Edge, Series II users can take gray-scale images and generate sharp halftones. Developed by Intel and DP-Tek, the Visual Edge should effectively boost the LaserJet's graphics resolution by 300 percent and printing speed by nearly 600 percent, depending on the program used and the complexity of the document.

In initial tests with *PageMaker 3.0*, a prerelease version of the Visual Edge consistently printed gray-scale images about six times faster than an unmodified LaserJet II would; with *Ventura Publisher 2.0*, output was one and a half times faster. And as you can see from the "before" and "after" printouts reproduced here, the results can be eye-popping.

The trick, of course, is printing more dots of various sizes per square inch and arranging them into halftone "cells" that can be sized, shaped, and overlapped to simulate different shades of gray. The Visual Edge board essentially takes care of the first part, forcing the printer's laser to create small and large dots; the Visual Edge software takes care of the rest, translating the gray-scale information in the scanned-image file into halftone cells of different shapes, sizes, and densities.

The quality of the Visual Edge's output naturally depends on the resolution (expressed in lines per inch, or lpi). A halftone screen at a resolution of 70 lpi can maintain up to 64 gray levels (instead of the LaserJet's usual 19); at 100-lpi resolution, 37 gray levels are possible.

Behind the Curtain

Priced at $695, the Visual Edge package includes a half-length board that fits into an 8-bit or 16-bit slot of an AT or compatible 286 or 386 system, a printer adapter board that slides into the Series II's optional I/O slot, a connecting cable, and software that includes *Windows* and *GEM* device drivers. But don't close that wallet yet—the Visual Edge needs at least 1MB of EMS 3.2 or 4.0 expanded memory. With 1MB, the board can print a quarter-page gray-scale image or a full page of

line art or other 300-dpi graphics; 2MB is necessary for a half-page gray-scale image, and 4MB gets you a full-page gray-scale image.

The Visual Edge doesn't replace the standard parallel or serial interface connecting the PC to the LaserJet; it still uses this route to transmit text to the printer. Graphics data, however, is funneled into expanded memory, processed by the Visual Edge, and finally combined with the text at the printer. The hidden bonus: Because the LaserJet's memory isn't used for composing the image, you don't need to upgrade the printer with an expensive dedicated RAM board. Spend the money instead on an expanded memory board that serves not only the Visual Edge but your other applications as well.

Although the Visual Edge is a super upgrade, it isn't for everyone. If you want to print documents incorporating sharp-looking scanned images with *Ventura*, *PageMaker*, and other *GEM* and *Windows* applications, you'll need the Edge. If you lack a gray-scale scanner or don't use gray-scale TIFF images in your publications, your money is better spent elsewhere. More important, remember that 4-bit gray-scale scanners, such as the Hewlett-Packard ScanJet, capture only 16 levels of gray—well within the power of an unadorned LaserJet Series II. For the Visual Edge to strut its stuff, it must have images captured with 6- or 8-bit scanners, which recognize 64 or 256 gray levels, respectively.

Halftones from the LaserJet: at the top, a typical 300-dpi image; below, the same image run through the Visual Edge system.

Right Time, Right Place

Of course, the Visual Edge isn't the only product that boosts the speed or resolution of the Series II. LaserMaster's LC2, Conographic's ConoDesk 6000, Talltree's JLaser Plus, DP-Tek's LaserPort, and other controller cards have been available for some time. But the Visual Edge's ability to speedily print higher resolution gray-scale images, and its relatively modest price, will put it ahead of the crowd—at least for a while. ●

Contributing Editor Richard Jantz is the author of Ventura Publisher 2.0 for the IBM PC: Mastering Desktop Publishing *(John Wiley & Sons, New York, 1988) and the forthcoming* Complete Scanner Handbook *(Peachpit Press, Berkeley, California, 1989).*

SNAPSHOT

Visual Edge

Intel's LaserJet Series II upgrade product is a double-duty wonder: It not only speeds up printer output but also increases the resolution of printed scanned images to the level of higher-quality halftones. The system requires at least 1MB of expanded memory.

KEY FEATURES

- **Improves the resolution of Series II graphics output by as much as 300 percent**
- **Speeds printing by 150 to 600 percent**
- **Compatible with PageMaker, Snapshot, Ventura Publisher, PC Paintbrush Plus, Publisher's Paintbrush, and other Windows and GEM applications**

AVAILABILITY

Release was scheduled for December 1988

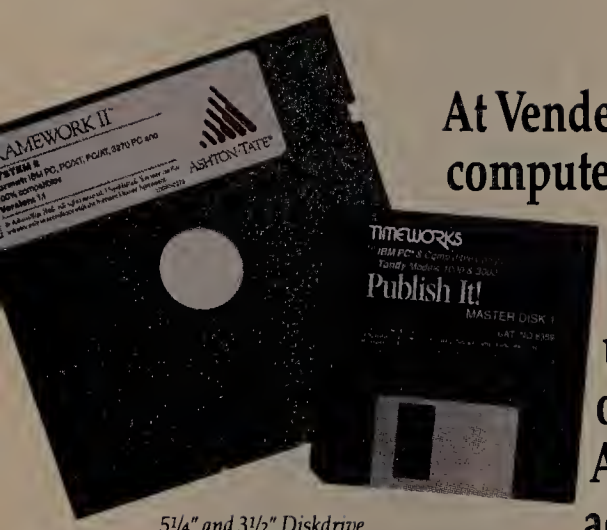
PRICING

$695 for the Visual Edge system—PC expansion board, printer adapter board, cable, and software

Intel Corp.
Personal Computer Enhancement Operation
5200 N.E. Elam Young Pkwy.
Hillsboro, OR 97124-6497
503/629-7354

For more information, circle 760 on reader service card.

HeadStart III™:



5¼" and 3½" Diskdrive Both Standard

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MICROPROCESSOR: Intel 80286-12
SPEED: 12MHz/8 Switchable
BIOS: Award • **BUILT IN RAM:** 1 Megabyte
EXPANDABLE TO: 3 megabytes
POWER SUPPLY: 145 watts 110/220 switchable
KEYBOARD: 101 key PS/2 compatible
GRAPHICS: VGA Autosync
FLOPPY DRIVES: one 5.25"1.2 megabyte, one 3.5"1.44 megabyte
HARD DRIVE: 32.1 megabyte, 28 milliseconds, 1:1 interleave
BUILT IN INTERFACES: Parallel, 2- RS232 serial, mouse, joystick
EXPANSION SLOTS: 3 available • **MOUSE:** Standard
SOFTWARE: DOS 4.0, GW Basic, HeadStart Advanced Environment, Floppy Driver, Framework II, 3-D Graphics, ATI and Computer-EEZ Tutorial Software, Xtree hard disk manager, Publish-it! Chessmaster 2000, Splash VGA paint program, Bookmark, plus Twist and Shout.

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Circle 10 on reader service card

PRODUCT OUTLOOK

79 **PRODUCT OUTLOOK**

Turbo-Cool 375
Loaded PCs can go full throttle and still stay cool under the hood with this dynamo power supply/dual-fan combo.

MediaBase
A hybrid hierarchical and relational data base manager organizes information intuitively.

MarqSystem
It looks like an unassuming mouse, but it's really a scanner, mouse, and optical character reader in one.

SitBack
Sit back and relax while this system automatically backs up your hard disk, tape drive, or file server in the background.

@Risk
Need to make more insightful projections? An add-in for *1-2-3* calculates probabilities and represents them graphically.

82 **BRIEFLY NOTED**

R:base Compiler, R:base Symbolic Debugger
Create an *R:base* application that runs up to three times faster than in interpreted mode, then debug it.

Step IVward
Convert *Clipper*, *Foxbase+*, and *Quicksilver* applications into *dBASE IV/SQL* source code with little rewriting.

XACT-11C, XACT-12C, XACT-16C
HP offers memory-resident counterparts to three of its popular hand-held calculators—for scientific, financial, and programming tasks.

Slice Duet
With *Slice Duet* you can select data from your *1-2-3* or *dBASE* files without loading them, then add the data to a popular word processor.

86 **UPDATE**

PFS: First Choice 3.0
Looking for a general-purpose but talented integrated package? *First Choice* now has a much-expanded menuing capability, a batch file function, and a host of other new features.

QuickBASIC 4.5
Ease into programming with the help of quick menus, tutorials, and a hypertext-like on-line reference all on one line.

The Norton Utilities Standard and Advanced Editions 4.5
Peter Norton's two data recovery and file management programs have been fine-tuned for greater speed, security, and ease of use.

FastWrite VGA
A boost in memory for this graphics board, plus new drivers for *Microsoft Windows* and *Ventura Publisher*, means added power for desktop publishing, presentation, and CAD/CAM jobs.

Q&A OS/2
Multitask with an OS/2 version of this flat-file data base manager that uses the protected mode to let you search a data base while editing a document.

Excel for Windows 2.1
Create larger worksheets and work faster than ever, thanks to this upgrade's use of extended memory and support of EMS 4.0.

Hardcard 40
Disk caching speeds the Hardcard's access time, and other enhancements hike its mean time between failures by 50 percent.

Formula/One 2.0
Mathtec's equation-solving program now graphs results in a range of styles and exports the graphs to popular packages.

dQUERY 2.1 and dQUERY/Lib 2.1
Quadbase Systems' query management system and library of Microsoft C routines include a relational data base engine and a limited SQL interface.

Hot Lead 1.1
Edit HP soft fonts in 23 ways using *Hot Lead*'s push-button commands.

GRASP 3.1
Mace Software adds macros and sound to its graphics animation system.

Draw Applause 1.1
Lower RAM requirements and a configuration manager help this presentation graphics package avoid conflicts with TSRs.

MultexQuote 2.0
This *Windows*-based product lets you pull financial data from Lotus's *Signal* into *Excel* for instant analysis.

Project Workbench 3.0
An electronic time sheet and "what if" capabilities make it easier to manage multiple resources and projects.

Turbo-Cool 375

More Power to the People

More boards, more and bigger hard drives, motherboard swapouts—there's so much going on under the hood these days, you may find you also need a bigger power plant to propel you along the upgrade path. More power often means more heat; to help your machine cope, PC Power & Cooling has put together a power supply/dual-fan combo that can rev up your PC to 375 watts and keep it 40 degrees cooler than a single fan would.

Appropriately named Turbo-Cool 375, the motor is almost twice as powerful as the typical 192-watt IBM AT power plant. That would be enough juice to handle 10 MIPS of processor power supported by 10 add-in cards and 3GB of storage, the company extrapolates. The power plant ships with a single integrated fan for $349; an optional second fan costs $65.

Turbo-Cool 375 packs 375 watts—almost twice the power of the typical IBM AT power plant—and its dual-fan version can cool your PC by 40 degrees more than a single fan.

The dual-fan combo gives you 2½ times the cooling capacity of the single-fan configuration. The auxiliary fan works behind the built-in fan and with the same airflow direction; but because its blades turn in the opposite direction, it reduces the airflow's circular component, sending more air straight out over critical surfaces. And its 50db murmur is only slightly louder than the 44db of the built-in cooler.

Because it accepts an input range of 80 to 135 volts, compared to the 95 to 130 volts typical of most power supplies, Turbo-Cool 375 is particularly appropriate for networks, where data-destroying power surges, sags, and brownouts are more insidious than power shutdowns. The system provides clean power longer than most in those circumstances, and it shuts down to prevent data errors if the current becomes too irregular.

During shutdown, Turbo-Cool 375 provides juice for up to 30 milliseconds, long enough to pass the baton to an uninterruptible power supply backup without losing a single bit of data. While most power supplies shut down in the event of a short circuit or oversupply of voltage, Turbo-Cool 375 also has a thermal sensor that shuts the system down if the box gets too hot.

Turbo-Cool 375 provides both the 5 volts of power most system operations require and the 12 volts needed for the motors in your various drives. The device fits any standard 286 or 386 form factor, both desktop and upright enclosures. But PS/2s and Compaqs need not apply.

Turbo-Cool is approved by Underwriters Laboratories and has a 50,000-hour mean time between failures. PC Power & Cooling, 31510 Mountain Way, Bonsall, CA 92003; 619/723-9513. —*Mike Hogan*

Reader service no. 702

MediaBase

Graphics Grabber

When somebody asks you where you were the December before last, you don't thumb back through your memory sequentially. Instead, you jump to 1987, then quickly to New Year's Eve and the party that you attended—and at that point, you decide whether to dodge the question.

MediaBase is a data manager that organizes information in much the same intuitive fashion, in categories, subcategories, and sub-subcategories. You structure your data bases in a single hierarchical outline, which is maintained in an on-screen window at all times for quick reference.

A hybrid of hierarchical and relational data base features, *MediaBase* lets you jump across categories as well as link them. You can search and report on more than one data base at a time, although you can't edit them simultaneously. You select the data bases to act on by pointing and clicking with a mouse or using the <Enter> key.

Pulldown menus offer the usual data base options. For example, you can search by adding subcategories that progressively narrow the search (*1987*, *New Year's Eve*, *party*); connect those search words with conditional operators (*and*, *or*, *not*, and so on); or just browse through the complete index of words that *MediaBase* keeps on all of your data bases. You won't miss a mention of your topic buried in an obscure file.

But *MediaBase* is at its best handling nontextual information, and it's less likely to be found keeping track of social calendars than, say, helping a corporate marketing information manager follow promotional campaigns. Each record in a data base can contain variable fields totaling up to 64K; more important, *MediaBase* will let you attach bit-mapped graphics of unlimited size to any text field so that the images pop up when the text record is accessed. You also can tap into analog video on a laser disk—and see full motion or still video, with one- or two-track sound (this means a marketer could look for cereal campaigns and come up with a television commercial).

Such specialized applications, though, call for

more than the $750 personal version of the data manager. Fortunately, *MediaBase* was originally designed as a publishing tool for high-density media, particularly CD ROM. With a $5000 set of utilities, publishers can output a data base onto nine-track tape in the High Sierra format for pressing onto CDs, bypassing costly data-preparation services. A retrieval-only utility, to be pressed onto CDs developed with *MediaBase*, is $50 per copy.

The personal version requires DOS 3.0 or a later version, 640K of memory, and a hard disk. *MediaBase* supports the Microsoft mouse, the Hercules Graphics Adapter, and CGA and EGA color graphics, along with CD ROM and laser disks, Fujitsu hard drives (up to 1.2GB), and the nine-track Fujitsu tape drive. Crowninshield Software Inc., 1105 Commonwealth Ave., Boston, MA 02215; 617/787-8830. —*Mark Henricks*

Reader service no. 703

MarqSystem

Multimouse

Input options are expanding from keyboards to mice, image scanners, optical character recognition (OCR) devices, and beyond. But how many devices can you attach to a single computer?

The MarqSystem from Marq Technologies increases your choices and reduces desk clutter by combining three of the most popular input devices within the confines of a mouse. If you use a mouse, a scanner, or an optical character reader—especially for desktop publishing—you'll appreciate the beauty of having them literally at your fingertips. You also avoid the tangle of cables and power sources required for running the hardware separately.

The MarqSystem puts a full-featured mouse, scanner, and optical character reader at your fingertips without hogging your desktop.

You start with a programmable, four-button, 600-dpi mouse and its single-slot adapter. Compatible with Microsoft, Logitech, and Mouse Systems mice, the instrument and its accompanying software let you create custom applications within specific programs. For example, you can pop up a window in *WordStar* and hit a button to scroll up or down. You can program the mouse's speed, button functions, and software settings at any time by using the two front buttons and a drop-down menu. The company also has released *MarqNavigator*, a program that lets you move speedily around *1-2-3* and perform many commands via Marq's or any compatible mouse.

You upgrade to a handheld image scanner and/or optical character reader by plugging their respective optical cartridges into a slot at the front of the mouse and adding piggyback expansion boards with the appropriate software to the mouse card. For example, you can turn the mouse into a handheld 300-dpi scanner that reads 16 levels of gray. Its input technique is unique: You set the unit anywhere on the page, and without lifting it again, "brush" the image onto disk using broad strokes—like rubbing an eraser over a chalkboard but with the reverse effect. An 8½ by 11 page of line art can be scanned in about 20 seconds. Images are saved in .PCX, TIF, and *GEM* formats, and as .DXF files for CAD programs.

When the OCR hardware and software are installed, the device can read multiple fonts and type sizes on a single page, as well as proportionally spaced type. You can cover a page of text in about 90 seconds, viewing the characters through a fiber-optic-lit window as they are scanned. Designed for reading numerical spreadsheet data, the OCR speeds input. By exploiting voice-synthesis hardware on the board, it also enhances accuracy by reading the numbers aloud through earphones or an amplified speaker. Nothing Mickey Mouse about this system.

The device requires DOS 2.0 or a later version and 256K of memory. The cost of putting all of these capabilities in the palm of your hand starts at $199 for the mouse. Moving up to the scanner is another $799, and adding character recognition costs an additional $1299.

Marq Technologies, 6285 Nancy Ridge Dr., San Diego, CA 92121; 619/452-2373. —*Glenn Grant*

Reader service no. 704

SitBack

Background Backup

Backing up files is a lot like dental hygiene: By the time you get serious about flossing and brushing, it's usually too late. *SitBack* is a memory-resident utility that takes the bite out of hard disk backup by saving files in the most convenient way—without your involvement.

You can program *SitBack* to back up your files at any time during the day or after the keyboard has been inactive for a set length of time. The program's data-saving functions are painless, requiring only 12.5K of memory and operating in the background so that you aren't interrupted when a backup is under way.

"Carbon Copy Plus helps us keep 225 stores in focus!"

Steve Hendricks
MIS Director, Fox Photo
San Antonio, TX

FOX PHOTO

Carbon Copy Plus doubles your productivity—just ask our users!

"At Fox Photo, our store employees are good at photo processing, not computer processing. That's why we depend on Carbon Copy Plus. Using standard phone lines and modems, my staff can remotely troubleshoot in-store computer problems, download files without interrupting store business and collect daily production and quality control information from all 225 outlets.

"Carbon Copy Plus, and its sister product, CCExpress, let us remotely monitor and control the PCs at each store. Most importantly, they let us do this reliably and cost effectively from corporate headquarters, giving us "up-to-the-minute" information on each store and freeing our time for other projects."

Remote Control—and Much More!

Steve Hendricks, and thousands like him, have found Carbon Copy Plus to be an indispensable tool for managing a business. That's because it combines so many features in one easy-to-use communications program: Remote program control, terminal emulation, background file transfer, universal graphics translation, and data security to name just a few.

Join the Crowd!

Carbon Copy Plus can save you time and money—just as it does everyday at Fox Photo. Call today for more information, or see your local computer dealer. Find out why Carbon Copy Plus is one of today's most popular communications programs and the leader in remote control software.

Carbon Copy plus

MERIDIAN TECHNOLOGY INC
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7 Corporate Park Suite 100 Irvine, CA 92714 (714) 261-1199

A separate Carbon Copy Plus is required for each location.
Carbon Copy Plus and CCExpress are trademarks of Meridian Technology.

Circle 170 on reader service card

SitBack automatically backs up files to or from any DOS device such as a removable hard disk or tape cartridge, a second hard disk, a network file server, or even a floppy disk drive. It will back up the same file on several different backup devices simultaneously. If you save files to a floppy disk drive, *SitBack* can create a dedicated backup disk to prevent files from accidentally being stored on a program disk or any other disk you may have left in the drive. The program also backs up memory to disk files so you don't lose work in progress if power is cut off.

You can choose the parameters of the backup, selecting files only from a particular storage device or directory or with the same file-name extension. *SitBack* exempts specified files from backup and can automatically exclude files with .EXE, .COM, or .SYS file extensions. You also can set the program to perform an incremental backup only on newly created files or existing files that have been modified.

If speed is your need, you can soup up *SitBack* with a special program speed setting. Additionally, you can increase the amount of memory the program uses for file saving. However, both modifications increase the likelihood of an application stalling until *SitBack* completes its tasks.

Should disaster occur and your files get zapped, *SitBack*'s restore utility easily recalls files back to any storage device or to another PC. Even if you're one of the conscientious few who already use a backup device or backup software, *SitBack* serves as a convenient safety net.

SitBack lists for $99 and requires DOS 3.0 or a later version and 13K of memory. SitBack Technologies, 7219 W. 95th St. #301, Overland Park, KS 66212; 913/894-0808. —*Wes Nihei*

Reader service no. 705

@Risk

Probability Processing

Spreadsheets spit out such convincing answers to your "what if" questions that it's easy to forget that their neat numerical models imply a precision rarely found in everyday life. Even if you acknowledge chance's role in the typical spreadsheet model, trying to qualify it may be as much an exercise in intuition as computation.

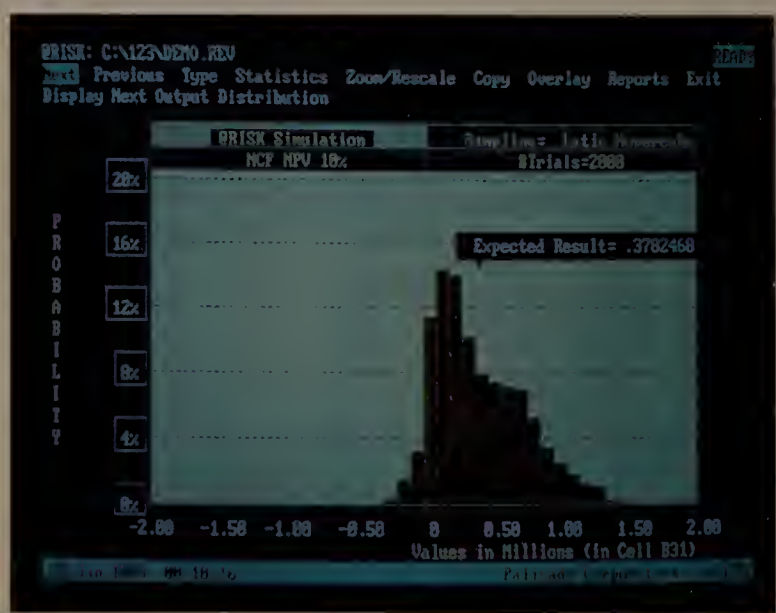
@Risk won't remove luck from the life of a strategic planner, actuary, or other financial decision maker. But this new *1-2-3* add-in from Palisade Corporation does offer a more accurate glimpse of where your assumptions stand relative to the elusive Lady.

The risk-management tool works by marrying the techniques of probability distribution and simulation. For example, a petroleum engineer unsure about the future price of oil can enter a range of possible values for that key cell in a drill/don't-drill model. *@Risk* uses Monte Carlo–type simulation techniques, randomly sampling a large number of possibilities within the range to give you the likelihood of a particular outcome.

If you have trouble visualizing this, you won't have to rely on raw data for the picture. *@Risk* is a true Lotus add-in, so without leaving *1-2-3* you can pull up a bar graph, cumulative overlaid curves, or any of *@Risk*'s other high-resolution graphics routines to view the range of a trend or the chance an event will occur.

@Risk requires *1-2-3 2.0* or a later version and at least 512K of memory. The package supports VGA, EGA, CGA, and Hercules display modes. Output files are in .PIC format for output to graphics packages or printers. The suggested retail price is $395, with a 30-day refund policy. Palisade Corp., 2189 Elmira Rd., Newfield, NY 14867; 800/432-7475. —*Mark Henricks*

Reader service no. 707



@Risk can't eliminate the element of chance from your strategic plan making, but it can help you figure out whether the odds are stacked for or against your 1-2-3 model.

R:base Compiler, R:base Symbolic Debugger

Microrim has introduced a menu-driven native-mode compiler that will support applications written in its *R:base for DOS* and *R:base System V* data base languages.

R:base Compiler lets you write and distribute unalterable but fully executable versions of interpreted *R:base* applications, which Microrim claims can run two to three times faster than in interpreted mode. These .EXE files do not require a copy of *R:base* to execute, and so can yield significant savings in a multiuser environment.

THIS IS NO PLACE FOR SPACE INVADERS.

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Intel® 286 microprocessor
10/8 MHz

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16/8 MHz

PowerMate 1 Plus
Intel 286 microprocessor
12/8 MHz

NEC

NEC Information Systems, Inc., 1414 Massachusetts Ave., Dept. 1610, Boxborough, MA 01719.

C&C Computers and Communications

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With R:base Compiler and R:base Symbolic Debugger, you can build executable versions of R:base data bases for each member of your work group—and protect your data in the process.

R:base Compiler also extends the range of *R:base* conditional statements as well as the depth of procedural calls, and supports forms and reports in applications. While the compiler doesn't require that you create overlays, you can save on an application's memory requirements by overlaying data base routines and command files.

The program includes R:base Symbolic Debugger, which is menu-driven also. The debugger eliminates the link step, for faster execution; displays call sequences; lets you change variables by name; and will run applications without stopping, either in single-step mode or with breakpoints that can be added or removed during debugging. The Debugger indicates the current source code line and, with the touch of a key, presents the application's screen display as it should appear at the current point of execution. You can use standard DOS commands without leaving the debugger.

R:base Compiler, which retails for $895, requires DOS 3.1 or a later version and 512K of memory. Microrim, 3925 159th Ave. NE, Redmond, WA 98052; 206/885-2000.
Reader service no. 708

Step IVward

Ashton-Tate's *Step IVward* converts applications written in Nantucket's *Clipper*, Fox Software's *Foxbase+*, and WordTech's *Quicksilver* dialects into *dBASE IV/SQL* source code with a minimum of rewriting. *Step IVward* is a menu-driven, standalone utility that duplicates most of the functionality in *dBASE* clone applications, including file-tree processing, in-code commenting, and full printing capabilities.

The utility, which requires DOS 3.0 or a later version and 640K of memory, retails for $89.95. Ashton-Tate, 20101 Hamilton Ave., Torrance, CA 90502-1319; 213/329-8000.
Reader service no. 709

XACT-11C, XACT-12C, XACT-16C

CalcTech has introduced three software calculators that are the functional equivalents of hand-held models from Hewlett-Packard. Each calculator in the *XACT* series is a memory-resident program that emulates the corresponding HP model while providing additional features such as the ability to save programs to disk, simulated paper-tape readouts, and on-line help.

The *XACT-11C*'s counterpart is the HP-11C Scientific calculator with standard math, trigonometric, statistical, and other functions as well as 20 available memories and the ability to write programs up to 203 lines long.

The *XACT-12C* emulates the HP-12C Financial calculator and includes standard algebraic operations; interest, amortization, depreciation, and bond calculations; cash-flow analyses; and statistical functions.

The *XACT-16C* corresponds to the HP-16C Programmer's calculator with Radix conversions, bit manipulation functions, floating-point calculations, and conditional logic functions as well as 16 available memories and the ability to write programs up to 203 lines long.

All of the *XACT* models require DOS 2.0 or a later version, plus 128K of memory, and retail for $49.95. CalcTech, Inc., 13629 Bellevue-Redmond Rd. #202, Bellevue, WA 98005; 206/643-1682.
Reader service no. 710

Slice Duet

Slice Duet lets you create integrated reports without expensive and complicated integrated software by transferring data from *1-2-3* worksheets and *dBASE* files into documents created with *WordPerfect*, *WordStar*, *Microsoft Word*, *DisplayWrite*, and about 50 other popular word processors.

This single-function memory-resident program displays a menu of *dBASE* files and *1-2-3* worksheets, allowing you to access those files with a few keystrokes and extract the data you desire without having *1-2-3* or *dBASE* running.

Slice Duet lets you mark a range, but more often it is used to "slice" out rows or columns of data that need not be contiguous. These sliced portions of your worksheet or data base appear together, in their original order, in edit mode. You can then add simple math formulas to the cells or fields to perform operations on them before importing them into your word processor.

You also can select name and address data from a data base and pass

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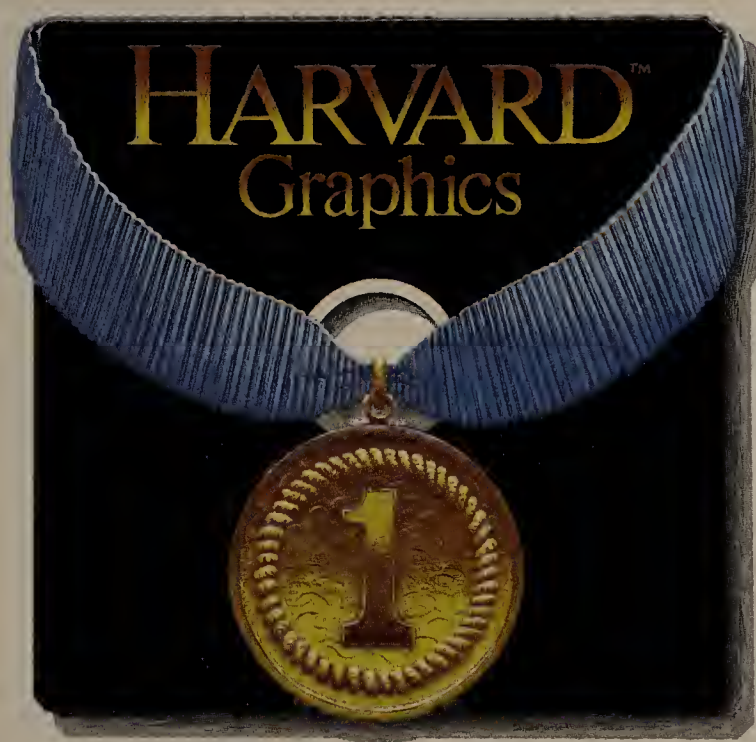
"Product of the Year"–Infoworld 1988



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© 1988 Software Publishing Corporation, 1901 Landings Dr., Mt. View, CA 94039-7210. Runs on IBM PC and MS DOS compatibles

it to the mail-merge function of your word processor. Moreover, you can reinsert modified records back into *dBASE* without ever loading the data base.

The suggested retail price is $149. *Slice Duet* requires DOS 2.0 or a later version and 40K of memory. Lightning Word Corp., 1601 Civic Center Dr. #206, Santa Clara, CA 95050; 408/241-1990.
Reader service no. 711

UPDATE

PFS: First Choice 3.0

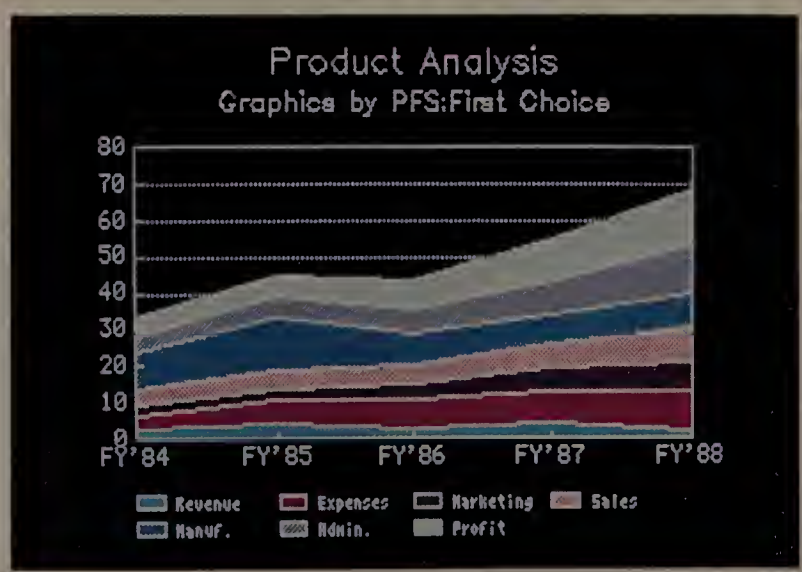
PFS: First Choice 3.0 contains more than 100 new features, including a greatly expanded menuing capability that lets you use the package as both a DOS shell and a character-based graphic environment. The integrated program is easy to use, melding word processing, data base management, spreadsheet, graphics, and communications for first-time users and those whose application needs are diverse but not deep.

You now can create batch files that let you run other programs without leaving *First Choice*, as well as macros of up to 1000 keystrokes for automating commonly executed command sequences from anywhere in the program. You also can execute most common DOS commands such as COPY and ERASE from within any *First Choice* application (with the exception of DISKCOPY and FORMAT, which run only from the main menu).

First Choice 3.0 contains new font, type-size, and character-spacing capabilities for creating text charts with its word processor. The results can be viewed on screen or printed as a transparency on the appropriate printer. Text and graphics can be mixed for on-screen presentations on a laptop computer; these can be run manually or automatically at timed intervals.

The word processor itself gains a new utility to import and export files to and from *WordPerfect*, *Microsoft Word*, *WordStar*, and other popular word processors. The data base can generate forms with field calculations, conditional statements, and data entry validation. The spreadsheet now imports and exports *1-2-3*, .WKS, and .WK1 files, as well as delimited ASCII to and from a data base.

PFS: First Choice 3.0, which requires DOS 2.0 or a later version and 512K of memory, retails for $159. Upgrades from version 2.0 are available for $35. Software Publishing Corp., 1901 Landings Dr., Mountain View, CA 94039-7210; 415/962-8910.
Reader service no. 715



PFS: First Choice 3.0 adds a character-based interface, greatly expanded menu capabilities, and about 100 other new features.

QuickBASIC 4.5

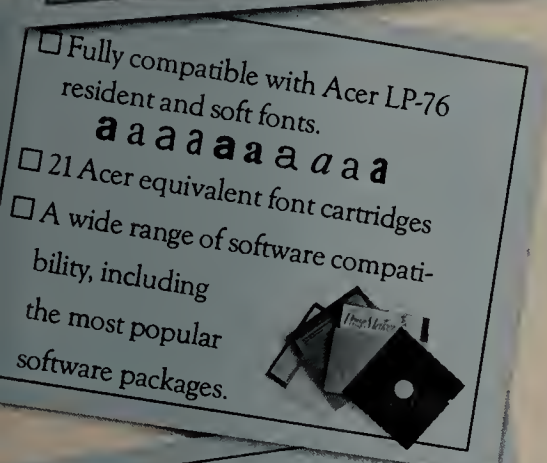
Shortened menus, an on-line reference system, and on-line tutorials make it easier to get up to speed when programming in QuickBASIC 4.5. Included among the interface enhancements are menus and dialog boxes that reduce the number of choices confronting the beginning programmer but that also can be expanded to include all QuickBASIC 4.5 commands.

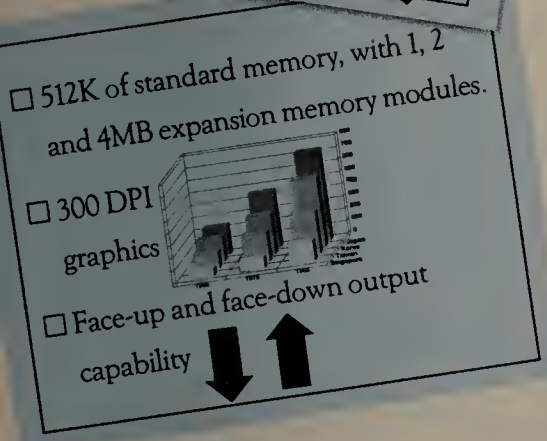
Microsoft claims that its QB Express tutorial will teach you in 10 minutes all you need to know to navigate the environment, including how to use the menus and the function-key list at the bottom of the screen. A step-by-step tutorial in QB Express takes you through the development of an electronic card file, helping you learn basic programming skills.

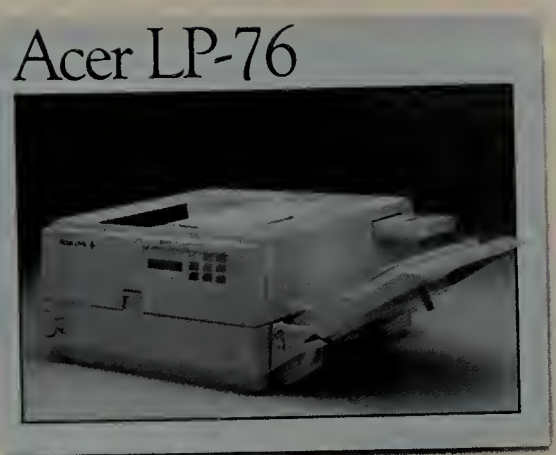
The QB Advisor on-line reference relies on hypertext technology to put a wealth of information at your fingertips through its extensive cross-referencing. By placing the cursor on a program statement, error message, dialog box, or menu choice and then clicking the mouse, you get an immediate context-sensitive explanation of the highlighted item. Individual elements of the explanation are "buttoned" so that you can cross-reference related topics or explanations of terms by pointing and clicking the mouse button or the <F1> key.

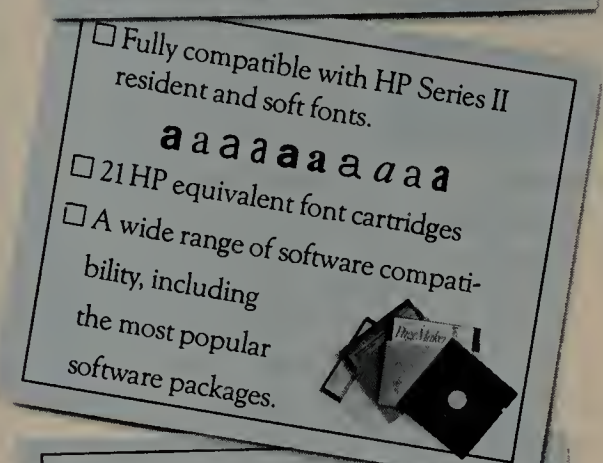
Also included in QB Advisor are more than 150 short sample programs—one for almost every one of the 220 BASIC statements—whose syntax can be cut and pasted into your own program to do such things as print.

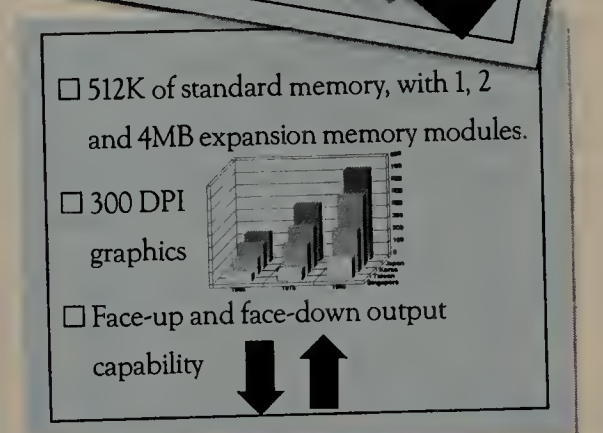
QuickBASIC 4.5 offers the same syntax-checking editor and rapid compilation of up to 150,000 lines per minute as earlier versions. Its improved source-level debugger has



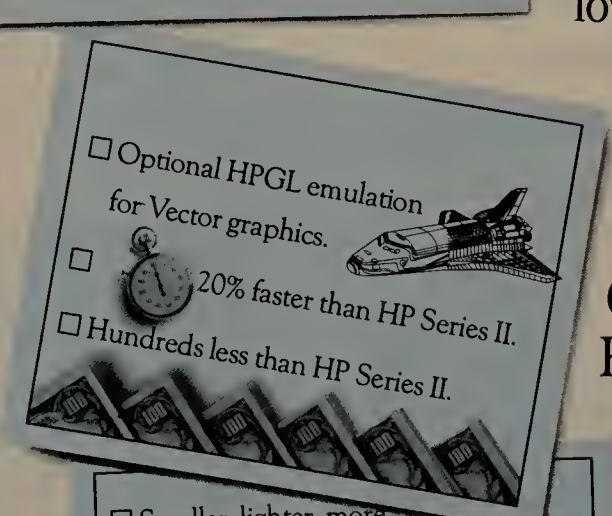


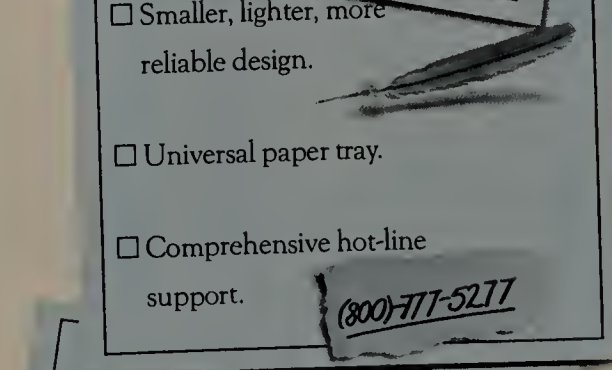


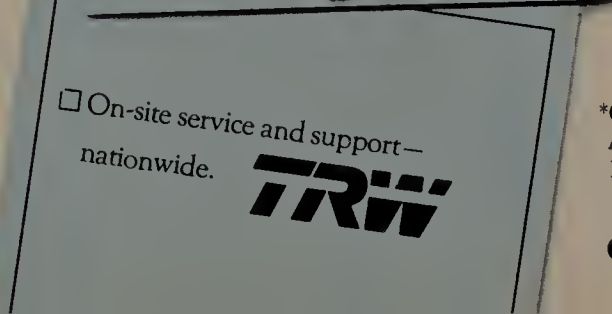




Here's where the similarity ends.







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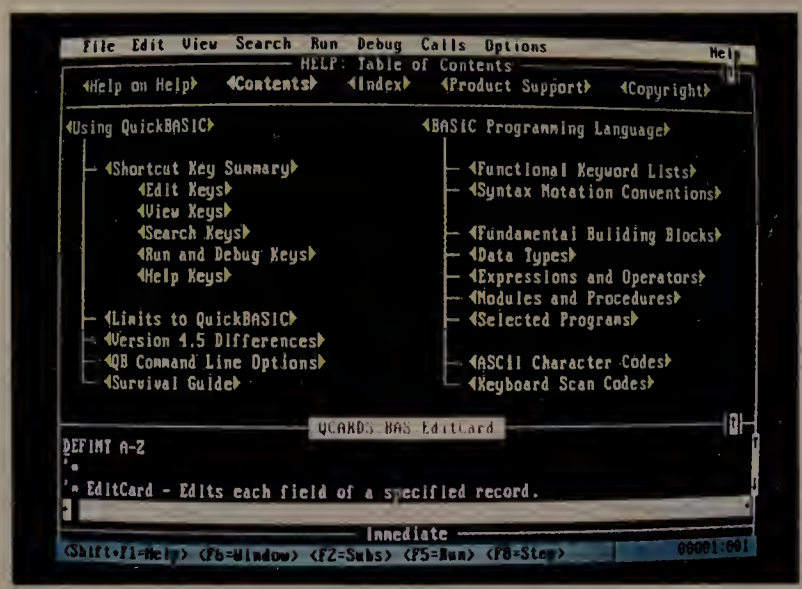
Circle 3 on reader service card



QuickBASIC is even faster and easier than before, thanks to version 4.5's shorter menus, an on-line reference and tutorial, and more than 150 short sample programs that you can cut and paste into your own programs.

an Instant Watch capability that lets you examine the value of a variable before you put it in the Watch Window, where you can track up to eight individual watch points or expressions.

This integrated environment allows you to switch easily between writing and debugging. It lets you interrupt an executing program, make changes, and instantly continue. You can activate the debugger at any time with the touch of a function key. Also, you no longer need an error handler in every module of your program since all of the modules in QuickBASIC 4.5 can employ the same main module error handler; this saves on source code.

QuickBASIC 4.5 is compatible with Microsoft BASIC Compiler version 6.0, which includes the *CodeView* debugger and Microsoft Editor. QuickBASIC version 4.5 requires DOS 2.1 or a later version and 384K of memory. It retails for $99. Upgrades are available for $25 for registered users of version 4.0 and $50 for users of earlier versions. Microsoft Corp., 16011 N.E. 36th Way, Redmond, WA 98073-9717; 206/882-8080.

Reader service no. 716

The Norton Utilities Standard and Advanced Editions 4.5

Versions 4.5 of *The Norton Utilities Standard Edition* and *Advanced Edition* data recovery and file management packages have been completely rewritten for greater speed and ease of use. Both editions add functions for safer computing such as the Data Protect feature, which saves your file allocation table (FAT), and root directory information to help recover heavily fragmented files and directories automatically using Quick UnErase and Unremove Directory.

The Norton Control Center, which replaces the DOS MODE command, lets you interactively select your system configuration elements including keyboard rate, video mode, screen and palette colors, and time and date.

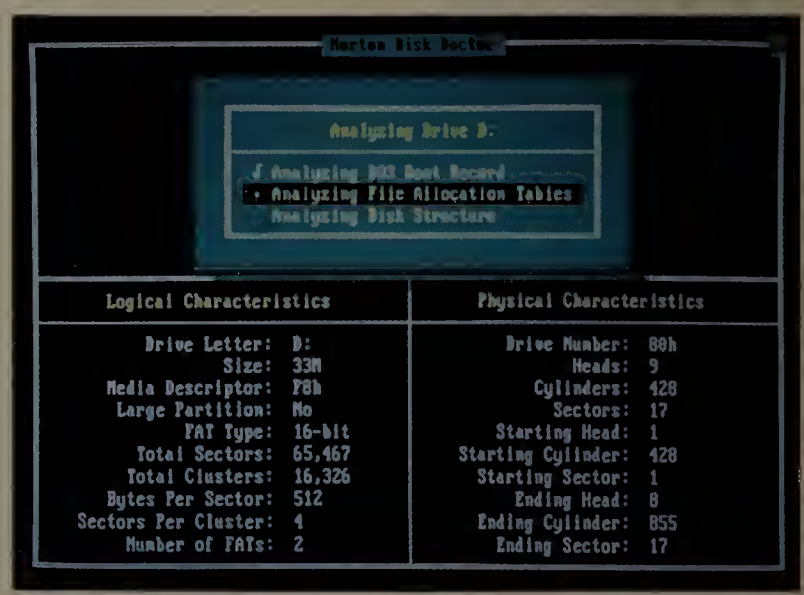
Both editions also incorporate the Batch Enhancer, a utility that lets you create interactive batch files complete with zooming dialog boxes. You can even use the Batch Enhancer to create your own windowed menu system. Norton has enhanced many of its existing utilities with revamped user interfaces that feature dialog boxes and menus of color choices.

The Advanced Edition includes Norton Disk Doctor, which automates the process of analyzing and repairing damaged disks. Disk Doctor is designed to help less technically proficient users by automatically performing the tests necessary to diagnose common disk problems such as a bad hard disk data track. When it discovers problems, Disk Doctor reports on them and, if asked, repairs them when possible.

If you accidentally format a hard disk, using Format Recover in *The Advanced Edition* version 4.5 helps you recover data with approximately 99.5 percent accuracy. Both editions let you format a floppy without destroying data already on it by using Safe Format, all but eliminating the danger of accidental erasure during formatting.

Both editions require DOS 2.0 or a later version and 256K of memory. *The Norton Utilities Advanced Edition* version 4.5 retails for $150. Standard Edition costs $100. Upgrades from version 4.0 are available for $39 (Advanced) and $25 (Standard). Peter Norton Computing, 100 Wilshire Blvd., 9th Floor, Santa Monica, CA 90401-1104; 213/319-2000.

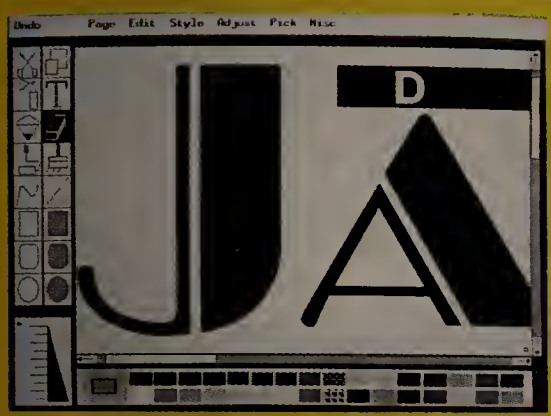
Reader service no. 717



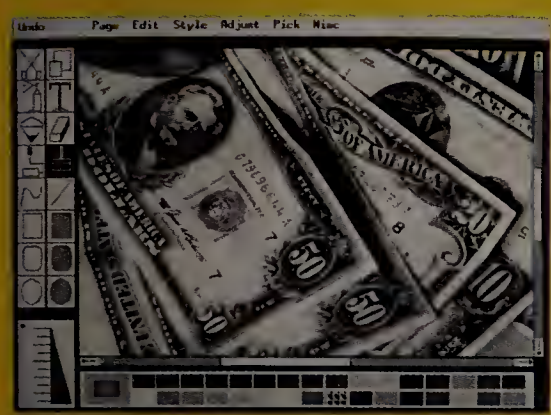
Standard and Advanced Editions of Norton Utilities 4.5 speed data recovery and file management with new functions and menus for safer computing.

Publisher's Paintbrush™

The art of desktop publishing



This masthead was created using the fonts and typographic features of Publisher's Paintbrush.



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Circle 206 on reader service card

FastWrite VGA

The FastWrite VGA graphics board has gained a 256K memory upgrade that brings total memory to 512K. The upgrade is bundled with software drivers for *Microsoft Windows* and *Ventura Publisher*, enabling the board to display two colors at 1024 by 768 noninterlaced resolution. With the additional memory, FastWrite VGA can exploit its built-in *AutoCAD* driver with four colors at that resolution, and its *AutoShade* driver (which supports 256 colors at 640 by 400) for enhanced performance in desktop publishing, desktop presentations, and CAD/CAM.

FastWrite VGA already displays 16 colors at 800 by 600 and 720 by 540, as well as 256 colors at 640 by 400 with 256K of memory. It includes Video Seven's FastWrite memory caching, and is compatible with the IBM PS/2 Display Adapter, EGA, CGA, MDA, and the Hercules Graphics Card.

The upgrade is available from Video Seven for $159. Video Seven, Inc., 46335 Landing Pkwy, Fremont, CA 94538; 415/656-7800.

Reader service no. 719

Q&A OS/2

Symantec has released a version of *Q&A* that runs under OS/2's protected mode. You can now run multiple simultaneous sessions of *Q&A* and address up to 16MB of memory for larger files.

With *Q&A OS/2*, you can search a data base while editing a document or performing a mail merge. The additional memory capability lets you create documents of up to 500 pages under OS/2's protected mode. Additionally, the package provides record locking, automatic screen update, and password protection so that OS/2 and DOS users can share a data base on a network.

Q&A OS/2 retails for $349 but is available free to owners of *Q&A* version 3.0 through an exchange of disks. Symantec Corp., 10201 Torre Ave., Cupertino, CA 95014; 408/725-2752.

Reader service no. 720

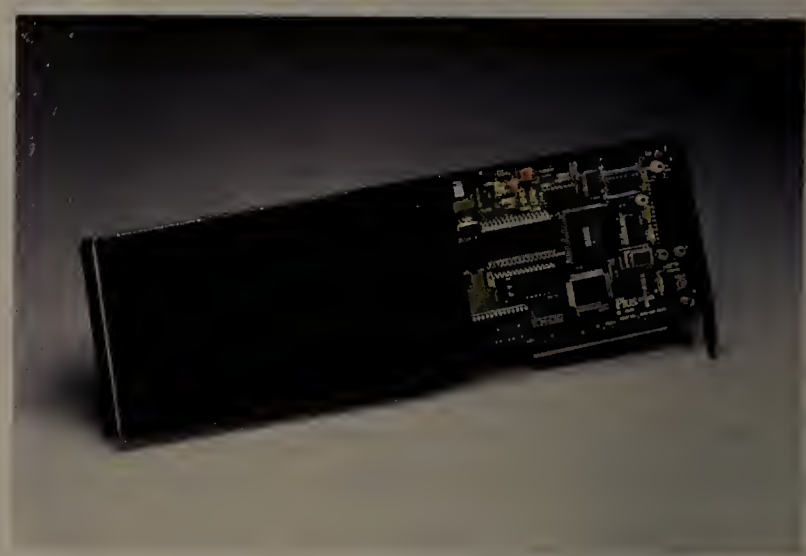
Excel for Windows 2.1

Microsoft has upgraded *Excel for Windows* to make more memory available and offer output enhancements. *Excel for Windows* version 2.1 ships with a run-time version of *Windows/286* that takes advantage of extended memory in 80286- and 80386-based machines to put 64K of the environment's code in high memory. *Excel for Windows* can now access up to 45K of that to leave 205K of conventional memory for data. This both increases the speed of operation and enhances your ability to create large worksheets. The program also supports EMS 4.0, providing more effective expanded-memory capabilities.

Version 2.1 supports 66 additional printers and color plotters and offers access to soft fonts with the Hewlett-Packard LaserJet series. You also can customize your dialog boxes with a new dialog box editing utility. Finally, *Excel for Windows 2.1* includes a technical guide detailing how you can optimize your system's performance.

Excel for Windows requires DOS 3.0 or a later version, 640K of memory, a hard disk, and an EGA or VGA card. It retails for $495. Upgrades are priced according to when you purchased your present version. Microsoft Corp., 16011 N.E. 36th Way, Redmond, WA 98073-9717; 206/882-8080.

Reader service no. 721



PlusCache disk caching software gives the Hardcard 40 an effective average access time of 28ms.

Hardcard 40

Plus Development has added PlusCache disk caching software to its 40MB Hardcard 40 in order to achieve an effective average access time of 28ms. The Hardcard 40 incorporates voice-coil enhancements and a higher degree of silicon integration than previous versions, enabling Plus Development to claim a mean-time-between-failure rate of 60,000 hours (50 percent higher than before) and to offer a new two-year warranty.

A modified frame allows the card to fit in either 8-bit or 16-bit expansion slots. Previously, it fit only 8-bit slots.

The price remains $999. Plus will give the PlusCache software to those who have owned a Hardcard 40 since October 1, 1988; Hardcard 20 owners and new buyers can purchase the software for $39.

Plus Development Co., 1778 McCarthy Blvd., Milpitas, CA 95035-7421; 408/434-6900.

Reader service no. 722

Formula/One 2.0

Mathtec has added a graph-making capability to its equation solver. *Formula/One* revision 2.0 now supports bar, line,

New Version 3.0

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DACEASY™ MAKES A WORLD OF DIFFERENCE!

DacEasy™ Accounting. More Than 400,000 Growing Businesses Worldwide. DacEasy Accounting leads the industry as the number one selling, award-winning program Two-time winner of *PC World's* World Class Award and *PC Magazine's* Editor's Choice, DacEasy Accounting recently was named *InfoWorld's* Product of the Year. Again and again, DacEasy proves that it makes a difference.

INFO WORLD 1987 PRODUCT OF THE YEAR Reader's Choice

InfoWorld 1985 PRODUCT OF THE YEAR

PC MAGAZINE EDITOR'S CHOICE 1985-1987

Since its introduction in 1985, DacEasy Accounting, feature for feature, has won acclaim as the leader in accounting software. Now Version 3.0 features a new interface with transaction-oriented pull-down menus that makes it think like you think as a business person rather than an accountant. Readily installed with five quick questions, your business accounting is operating within 10 minutes! Choose the predefined Chart of Accounts that are tailored for service or inventory-based businesses, or modify. All seven modules (General Ledger, Accounts Receivable, Accounts Payable, Inventory, Billing, Purchase Order and Forecasting) are fully integrated. Data posted once is automatically posted to all other related modules saving you time and ensuring accuracy as well.

DacEasy Accounting's strength is its capability for generating reports that provide you with fast information and ultimately better management decisions. In fact, it provides you with more than 700 reports and "what if" forecasting scenarios based on three-year historical information — great for projecting expenditures and revenue. And, in addition to the program, you'll find the 460-page documentation is written for ease of understanding with helpful hints, screens and examples.

The only accounting software to win all four readers' contests in the past three years!

1986 PC WORLD WORLD CLASS AWARD · 1987 PC WORLD WORLD CLASS AWARD · 1988 PC WORLD WORLD CLASS AWARD

The DacEasy™ 3.0 Series. A World of Difference in Business Software. Naturally, out of the best-selling accounting program grew the need for related business programs such as DacEasy Payroll. The 3.0 version also features a new intuitive design, pull-down menus, flexible pay periods, current federal and state tax tables, automatic withholdings, printing of checks, W-2's and 1099 forms, and much more. It's no wonder DacEasy is the world's best-selling payroll and personnel management program!

Also new for 1988 is DacEasy Graph+Mate, a RAM-resident program that interfaces with DacEasy Accounting or Payroll. Its easy graphic reporting features pie charts, line charts, bar charts, stacked-bar charts and perspective bar charts. Plus custom file viewing, macros, pop-up calculator and notepad, and more make it the ideal companion.

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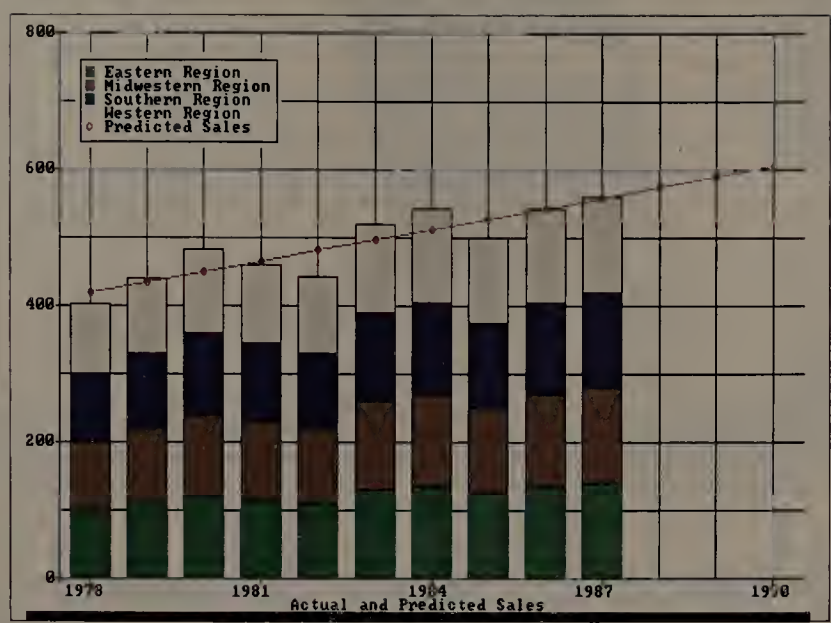

Mathtec has added a graph-making capability and broader printer support to Formula/One. Revision 2.0 can even display two graph types (in this case, stacked-bar and line graphs) in the same chart.

tee, and point graphs for equation-solving results. These can be merged into word processing files created with *WordStar*, *WordPerfect*, *Microsoft Word*, or an ASCII text editor. Data from *Formula/One* also can be exported to *1-2-3* and *dBASE*.

Formula/One's printer support has been expanded to include printers compatible with the HP LaserJet, the IBM Proprinter, and the Epson line, while its graphics support now includes CGA, EGA, VGA, MCGA, and Hercules monochrome. The program also can display results in tabular form both on screen and in print.

The program solves equations with proprietary analysis routines, which relieves you from having to reformulate basic equations. Equation building is simplified via 73 built-in functions on pulldown menus. Available are trigonometric, logarithmic, and general math functions as well as popular business math functions like standard deviation, variance, net present value, moving average, and cash flow.

Equations are built with these functions and the known variables, and *Formula/One* solves for all unknown variables. An experienced user can build an application display screen; an inexperienced user can choose instead to fill in the blanks with known values and have *Formula/One* solve the equation for unknown values.

Formula/One, which retails for $200, requires DOS 2.1 or a later version and 384K of memory. Registered users of past versions can upgrade for $100. Mathtec, Inc., 43 S. Main St., Newton, NH 03865; 603/382-7301.
Reader service no. 724

dQUERY 2.1 and dQUERY/Lib 2.1

Quadbase Systems has released versions 2.1 of *dQUERY*, an ad hoc query management system, and *dQUERY/Lib*, its supporting library of callable Microsoft C routines. *dQUERY 2.1* consists of a relational data base engine, a limited SQL interface, a Query By Example (QBE) query management system, and a report writer. *dQUERY 2.1* supports *dBASE* and *1-2-3* file formats, so you can create, update, and manipulate data files as well as query them in those formats, using four common SQL commands—SELECT, INSERT, UPDATE, and DELETE.

A template mode that helps novice users become accustomed to SQL is supported by multiple windows, pulldown menus, and function keys. *dQUERY 2.1*'s QBE interface lets you formulate queries by making entries in forms on screen. *dQUERY/Lib* permits software developers to access *dQUERY*'s data base engine and build applications that run faster than compiled data base programs do.

dQUERY 2.1, priced at $150, requires DOS 2.0 or a later version and 512K of memory. *dQUERY/Lib*, which includes a copy of *dQUERY 2.1*, retails for $295. Quadbase Systems, Inc., 790 Lucerne Dr. #51, Sunnyvale, CA 94086; 408/738-6989.
Reader service no. 725

Hot Lead 1.1

I.S.C. Industries has added a simplified interface to its *Hot Lead* font-editing package and completely reworked its capabilities. Version 1.1 of *Hot Lead* can edit Hewlett-Packard–compatible soft fonts with push-button commands, letting you resize characters horizontally or vertically to create special effects.

Hot Lead can edit the largest HP soft fonts (up to 288 points) and compress fonts by as much as 50 percent; it provides a fast font download procedure and can turn a .PCX file's scanned or painted image into a soft font. The program lets you change fonts in 23 ways, including reversing them; turning them upside down; creating mirror images; and adding black borders, shadows, or stripes.

Hot Lead, which requires DOS 2.0 or a later version and 384K of memory, sells for $199. Upgrades are $99 with original disk. I.S.C. Industries, 4025 N. Keystone Ave., Chicago, IL 60641; 312/286-5600.
Reader service no. 726

GRASP 3.1

Paul Mace Software has added macro capability to version 3.1 of *GRASP* (Graphics Animation System for Professionals). The system comes in two parts: GRASP, a presentation and animation programming module; and PICTOR, a painting program. Also included are screen capture and graphics printing utilities.

GRASP's macros let you predefine a sequence of commands to which variables can be passed at run-time. The package also includes new animation and sound-making capabilities.

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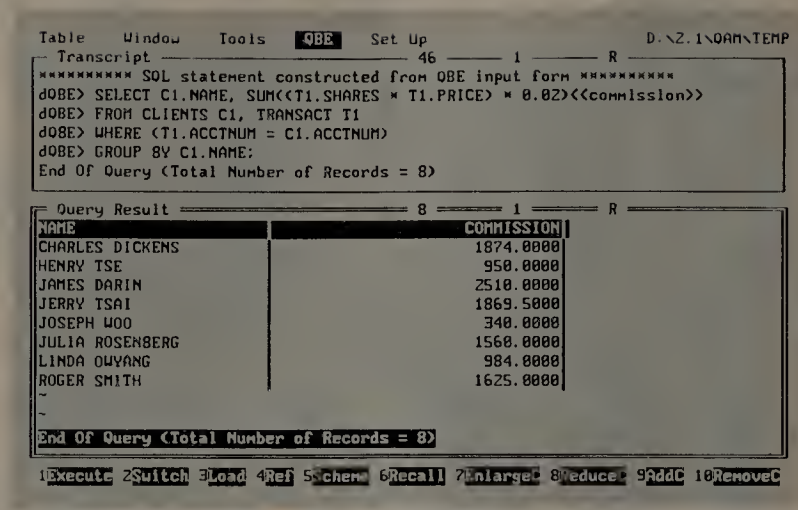
Circle 184 on reader service card

PICTOR gains painting and blending techniques, including color mixing in RGB or Process colors. It supports the PIC, .PCX, .GIF, .IMG, and BSAVE file formats and all graphics modes up through VGA.

GRASP's 74 commands make possible complete size and color control of multiple images, including virtual screens, pans, and transparent overlays. You also control on-screen drawing, painting, and text display, as well as keyboard, mouse, and touch screen input. *GRASP* costs $149; upgrades from earlier versions are priced at $35. The software requires DOS 2.0 or a later version and 256K of memory. Paul Mace Software, 400 Williamson Way, Ashland, OR 97520; 503/488-2322.
Reader service no. 727

Draw Applause 1.1

Version 1.1 of Ashton-Tate's presentation graphics program, *Draw Applause*, has reduced memory requirements and a configuration manager to simplify installation. Now when the program is invoked, the configuration manager creates alternative CONFIG.SYS and AUTOEXEC.BAT files, reducing the possibility of memory conflicts for users of complex environments or multiple memory-resident programs. *Draw Applause*'s own memory requirements have been reduced from 585K to 538K, leaving room for some memory-resident packages.



Quadbase Systems' dQUERY 2.1 Query by Example interface lets you formulate queries by making entries in forms on screen. A limited SQL interface is also included.

Version 1.1 now supports the Hewlett-Packard PaintJet printer (for full-color overhead transparencies) and the bus mouse. Ashton-Tate promises to provide registered users with additional device drivers free of charge as they become available.

Draw Applause requires DOS 2.1 or a later version and a hard disk, and retails for $495. Upgrades are free for registered users who call or write Ashton-Tate Graphics, 1000 Bridgeport Ave., Shelton, CT 06484; 203/925-5600.
Reader service no. 728

MultexQuote 2.0

MultexQuote 2.0 gives you access to the expanded range of financial information available with version 2.0 of Lotus's *Signal*, a real-time FM-band broadcast of financial markets trading data. In addition to listing more than 20,000 stocks, stock options, and commodity futures on all major exchanges, *Signal 2.0* offers information on mutual funds, money markets, commodities, and an expanded selection of more than 60 market indexes.

Running under *Windows*, *MultexQuote* lets you use the Dynamic Data Exchange protocol to transfer data to a Microsoft *Excel* spreadsheet for analysis. *MultexQuote 2.0*, which retails for $350, requires at least an 80286-based computer, 1MB of memory, a hard disk, *Windows/286* or *Windows/386*, *Signal* hardware, and a market data service subscription. Upgrades are free to registered users. Multex, 254 W. 31st St., New York, NY 10001; 212/629-7994.
Reader service no. 729

Project Workbench 3.0

Project Workbench release 3.0 enhances the program's resource management and tracking capabilities and adds an electronic time sheet to measure time expended on tasks. Its "what if" capability facilitates decision-making, and the package manages multiple projects and shows resource loading across them. You can balance the workload manually or let the program's auto-pilot facility handle the job.

The latest release also offers greater control over visual presentation and import or export of files to other applications. The program sells for $1275; release 2.2 is still available for $1150. Requirements are DOS 2.0 or a later version and 512K of memory; a hard disk is required for the single-user version. Upgrades are free for anyone who owns a current maintenance contract or has purchased release 2.2 after January 1988. Applied Business Technology Corp., 361 Broadway, New York, NY 10013; 212/219-8945.
Reader service no. 730

For more information about any product, contact the manufacturer or circle the number on the reader service card. ●

Glenn Grant is a freelancer based in San Diego; Mark Henricks is a PC World *contributing editor; and Wes Nihei is an assistant editor for* PC World.

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Can Anything Beat the Series II?

In most offices, laser printer means LaserJet.

But today's crop of LaserJet alternatives challenges that assumption.

Daniel Miles Kehoe

It's no crime to admit that Hewlett-Packard's LaserJet Series II is underequipped for certain output jobs. Despite its well-deserved popularity, the standard LaserJet Series II suffers from skimpy paper capacity, a limited assortment of resident fonts, and meager memory that confines graphics to minuscule proportions.

But is it possible to find a better buy than the Series II without sacrificing the broad hardware and software support that the LaserJet enjoys? To find out, *PC World* reviewed six laser printers that fall into three general categories. The Brother HL-8 and the QMS Kiss Plus closely resemble the Series II: They use the same print engine and feature the same rated maximum speed of 8 pages per minute (ppm). The Alps LPX600 and the Qume CrystalPrint Series II are 6-ppm printers more suitable for personal use than demanding office chores. Finally, the Toshiba PageLaser 12 and the C.Itoh LIPS II are fast, high-volume machines built to surpass the LaserJet's speed and capacity.

Brother HL-8

At first glance the $2895 Brother HL-8 appears identical to the LaserJet Series II. It uses the same second-generation Canon LBP-SX engine, and its print quality, paper- and envelope-handling talents, and even installation and setup are similar. Like the Series II, the HL-8 works with many third-party LaserJet accessories (though not LaserJet RAM expansion cards). Even more important, it passed National Software Testing Laboratories' (NSTL) LaserJet compatibility tests without a hitch. But significant differences such as faster graphics print speed and more standard memory make the HL-8 a better value.

In NSTL speed tests the Series II edged out the HL-8 in text printing, but the Brother machine easily bested the Series II in graphics printing. A standard LaserJet slows to a crawl when it prints graphics, and its 512K of memory is only enough to print a third of a page of graphics at full 300-dpi resolution. In contrast, the Brother HL-8 broke all NSTL speed records for laser printers

producing graphics-intensive pages. And the Brother's 1MB of RAM brings the user within half an inch of printing a full-page graphic. The HL-8 accepts up to 3MB of optional memory for holding downloadable fonts.

When it comes to print quality, the Brother HL-8 shares a LaserJet weakness: ghosting, or fading, in large black areas. In other respects, print quality is very good.

The HL-8's typographic features also best the Series II's. Resident fonts include Brougham, Anelia, and Letter Gothic in 10- and 12-pitch; bold italic and both portrait and landscape versions of all built-in fonts are included. The font-starved will rejoice that the HL-8 accepts all HP and third-party font cartridges, unlike the other printers reviewed. Additionally, a wide range of emulation modes—Epson FX-80, Diablo 630, IBM Proprinter XL, and Brother Twinriter—enables most software to use this printer.

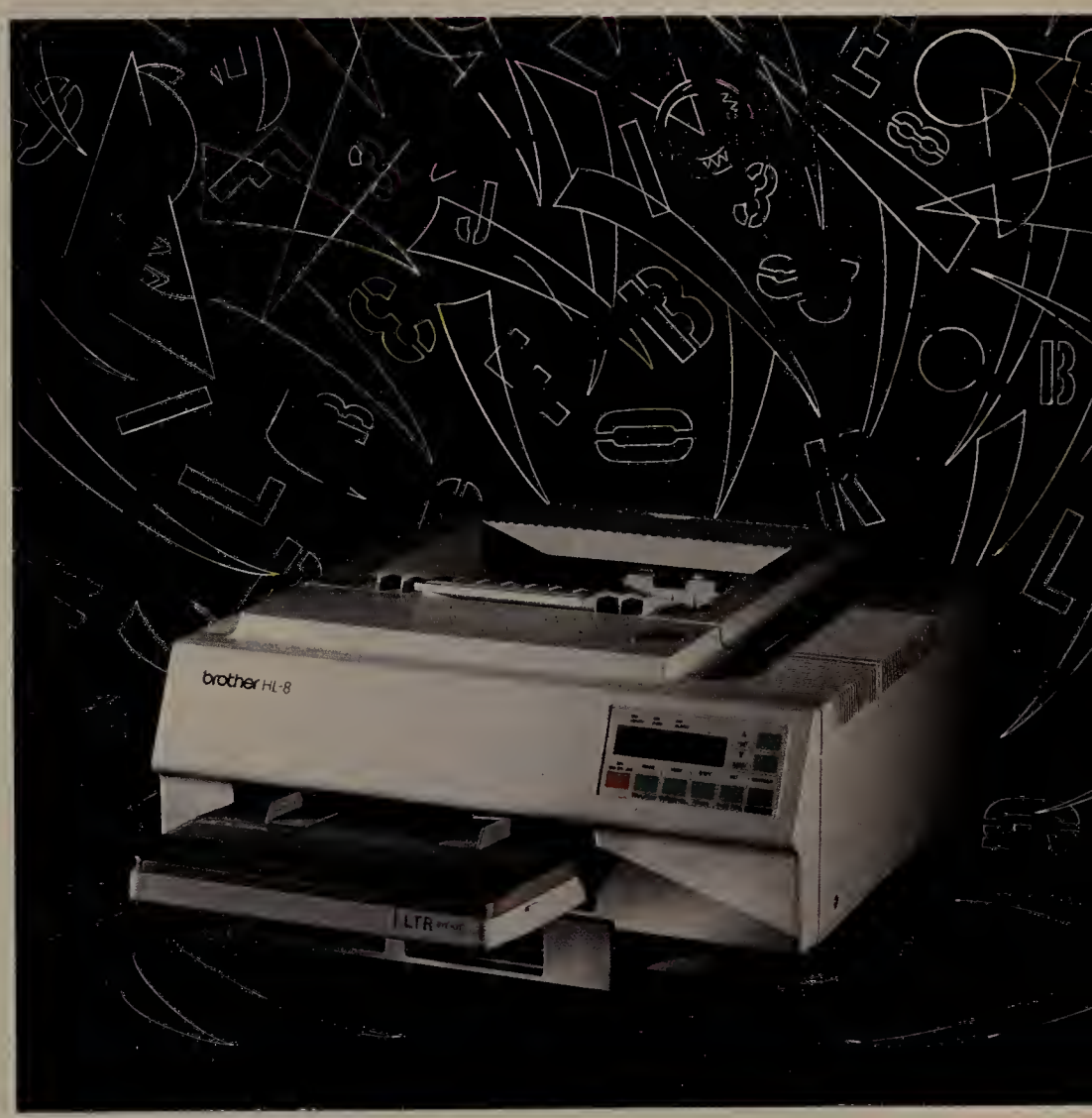
Overall, the Brother HL-8 is the Best Buy of the printers reviewed and a better buy than the LaserJet. For almost the same price, the HL-8 offers better graphics printing speed, more memory, more fonts, more emulation modes, and a superior control panel. There are no sacrifices either: The HL-8 maintains full compatibility with HP's PCL, font cartridges, and sheet feeders.

QMS Kiss Plus

At first glance, the QMS Kiss Plus seems to mimic the LaserJet, but the resemblance is only skin-deep. Mixed in with the similarities are just enough flaws to drop the Kiss Plus down on the shopping list.

QMS takes the value-added approach to laser printers. For $2195 you get a Canon LBP-SX engine and a QMS controller. Memory and emulations via three "personality modules" cost extra. The Personality Card 10 adds $495 to the base price; 512K RAM; and Epson FX-80, Diablo 630, Qume Sprint 11, and ANSI X3.64 emulations. For $795, the Personality Card 20 offers 1MB RAM and adds LaserJet Series II and IBM Proprinter emulations to the 10's list. The top-of-the-line $1595 Personality Card 30 offers 2.5MB RAM and additional HP 7475A plotter emulation. If you buy a Kiss Plus, choose your Personality Card wisely: Upgrading memory and emulations later means you have to buy a whole new card.

NSTL compatibility tests revealed that the Kiss Plus had problems producing *1-2-3*



The Brother HL-8 combines flawless Series II compatibility, more resident fonts than a LaserJet, 1MB standard RAM, and fast graphics printing to earn a PC World Best Buy.

PIERRE-YVES GOAVEC

FEATURES EVALUATION

LaserJet Alternatives

The Brother HL-8, our Best Buy, matches the LaserJet's features and offers more memory and built-in emulations to boot.

● Yes
○ No

	HP LaserJet Series II	ALPs LPX600	Brother HL-8	C.Itoh LIPS II	QMS Kiss Plus	Qume CrystalPrint Series II	Toshiba PageLaser 12
Standard features							
List price	$2695	$2175	$2895	$3545	$2990	$1999	$3799
Engine	Canon LBP-SX	Sharp	Canon LBP-SX	Kanica	Canon LBP-SX	Casio	Toshiba
Rated speed (ppm)	8	6	8	10	8	6	12
Rated engine life (thousands of pages)	300	200	300	600	300	180	600
Monthly duty cycle (pages)	5000	3500	3000	15,000	5000	3000	25,000
Standard memory	512K	512K	1MB	512K	1MB	512K	512K
Maximum memory expansion	4.5MB	2MB	3MB	2MB	2.5MB	1.5MB	2MB
Cost per page (cents)	4	3	4	3	4	5	3
Paper handling							
Paper capacity (sheets)	200	100	200	250	200	100	250
Prints legal-size paper	●	●	●	●	●	●	●
Prints envelopes	●	○	●	○	●	○	●
Facedown output	●	●	●	●	●	●	●
Faceup output	●	●	●	○	●	○	●
Typographic features							
Supports proprietary fonts	n/a	●	○	●	●	●	●
Accepts HP font cartridges	●	○	●	○	○	○	○
Accepts HP soft fonts	●	●	●	●	●	●	●
Emulations							
LaserJet Plus	●[1]	●	●	●	●	●	●
Epson	●[1]	●	●	●	●	●[2]	○
IBM Proprinter	●[1]	●	●	●	●	○	○
Diablo 630	●[1]	●	●	●	●	●[2]	●
HP 7475A Plotter	○	○	○	○	●	●[2]	○
Other	●[1]	●	●	●	●	●[2]	●

[1] Third-party product.
[2] Costs extra.

graphics and *WordPerfect 5.0* text with the LaserJet drivers installed. QMS explains that *WordPerfect 5.0* problems are corrected in printers with firmware version 4.01 or later.

In speed trials, the QMS Kiss Plus earned mixed rankings. It placed first among 8-ppm machines on long documents. But in graphics printing tests, the Kiss Plus finished behind the Brother HL-8 and even the 6-ppm Qume CrystalPrint Series II.

The Kiss Plus's print quality is almost identical to the LaserJet's, right down to the problems with ghosting. But gray shade patterns are less distinct than the LaserJet's, which makes them difficult to distinguish on some charts.

EXECUTIVE SUMMARY

Brother HL-8

Laser printer

It isn't easy to improve on a standard, but this printer goes the LaserJet Series II one better. Faster graphics printing speed and more standard memory, fonts, and emulation modes for the money than any other printer reviewed make the HL-8 the Best Buy of the bunch.

	POOR	FAIR	GOOD	EXCELLENT
Standard features			●	
LaserJet compatibility				●
Speed			●	
Print quality			●	
Paper handling			●	
Typographic features				●
Overall value				●

The Kiss Plus far outdoes the LaserJet's meager font selection with 17 resident fonts. But some of them are meant to be used only in the emulation modes and not with LaserJet drivers. For additional fonts, users will have to make do with soft fonts or purchase QMS proprietary font cartridges.

Unlike Brother's laser, the Kiss Plus doesn't support the many third-party accessories designed for the LaserJet. Among those excluded: HP font cartridges, printer sharing devices, and QMS's own JetScript PostScript board.

As a general office replacement for the LaserJet Series II, the QMS Kiss Plus falls somewhat short. Compatibility problems are potentially troublesome, and although the printer whips out LaserJet-quality text, toss in a graphic or two, and the Kiss Plus bogs down. In a head-to-head comparison, the Brother HL-8 and the Series II are both better deals.

The QMS Kiss Plus prints text at respectable speeds and offers decent print quality, but pricey upgrades and limited accessories make other printers a better value.

EXECUTIVE SUMMARY

QMS Kiss Plus

Laser printer

The Kiss Plus offers fast text printing and output quality similar to the LaserJet's, except for indistinct gray shades, which can result in imprecise graphics. We rated the printer only "Fair" due to its expensive upgrade path, occasional LaserJet compatibility problems, and slow graphics printing. Although the $2990 Kiss Plus isn't a bad deal, it's not as good a value as the $2695 Series II and the $2895 Brother HL-8.

	POOR	FAIR	GOOD	EXCELLENT
Standard features			●	
LaserJet compatibility		●		
Speed			●	
Print quality			●	
Paper handling			●	
Typographic features			●	
Overall value		●		

Alps LPX600

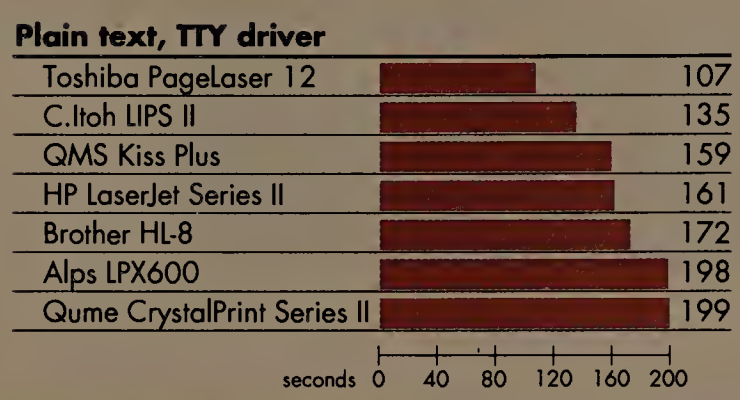
The Alps LPX600 promises exceptional value in a neat package. For $2795 you can buy an LPX600 loaded with 2MB of RAM, five emulation modes, and utility software to download soft fonts. The printer is small, light, and unusually quiet thanks to a 6-ppm Sharp print engine. Print quality is actually superior to the LaserJet Series II's—sharp, crisp type with dense blacks and distinct gray shades. Unfortunately, you'll need patience to see them since the LPX600 is one of the slowest printers in the bunch.

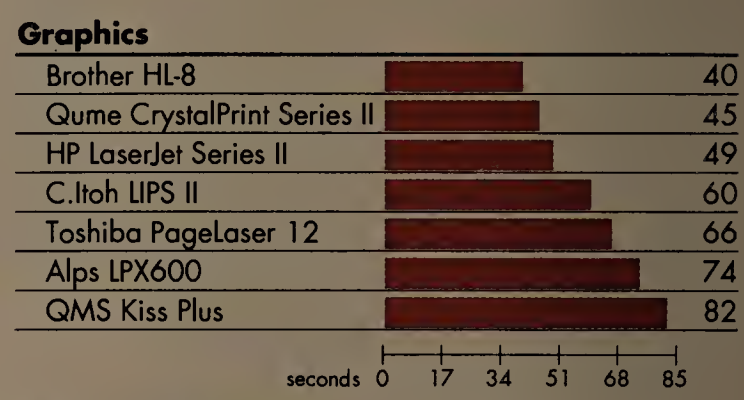
PIERRE-YVES GOAVEC

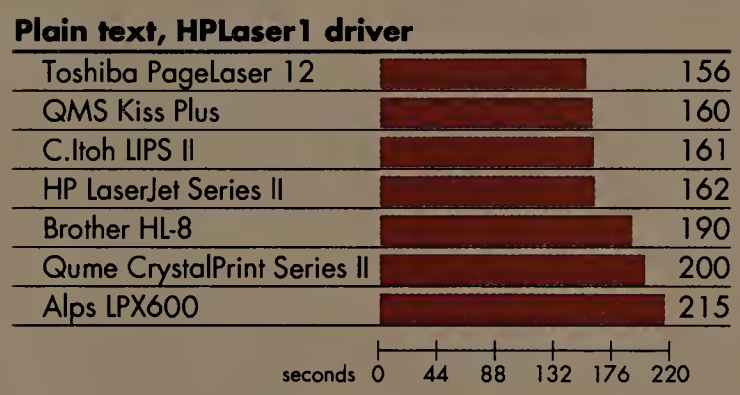
NSTL TEST REPORT

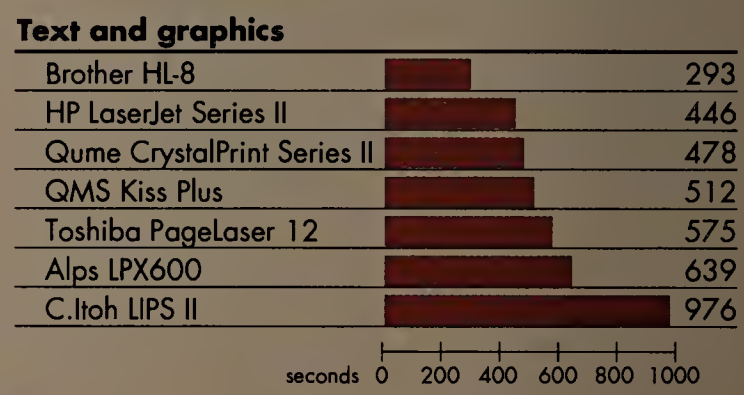
LaserJet Look-Alikes: Some Aren't as Fast

As expected, the 12-ppm Toshiba PageLaser was the fastest text printer; surprisingly, the 8-ppm Brother HL-8 topped all comers in graphics speed.









Benchmarks were conducted using a 12-MHz Compoq Deskpro 286 Madel 40 equipped with 1.2MB of RAM. Text printing speed wos tested using a typical business document creoted with *Microsoft Word 4.0*. Grophics printing speed wos tested using o *1-2-3* graph. *PageMaker* versian 1.0a wos used to test the printers' obility to produce text and graphics on the some poge. Timing begon when the command ta print was issued ond ended when the lost page came ta rest in the output tray.

Plain text, TTY driver
This benchmark timed the printing af 20 pages af ploin text without enhancements or formotting using *Word's* TTY printer driver.

Plain text, HPLaser1 driver
This benchmork timed the printing of the some 20 poges of ploin text using *Word's* HPLoser1 printer driver.

Graphics
This benchmork timed the printing of a *1-2-3* stacked bar chort using the Hewlett-Packord LoserJet Plus driver with the low-density aptian.

Text and graphics
This benchmork timed the printing of on 8-poge newsletter containing text and grophics—vorious type sizes ond fants, o sconned photo, ond a line drowing—using the HP Series II printer driver.

Data based on tests designed and conducted by National Software Testing Laboratories (NSTL). All rights reserved.

The LPX600's other major shortcoming is its limited paper-handling capability. The input tray holds a scant 100 sheets, and although the LXP600 can print envelopes, Alps doesn't recommend it. Alps currently has no paper-handling options for the printer, and the Sharp engine doesn't support third-party LaserJet accessories.

The LPX600's font selection is a mixed bag. The printer is the only one reviewed that comes with downloadable fonts—36 soft fonts on two floppy disks. But like the LaserJet, the printer has a slim selection of resident fonts, with only Courier and line-printer fonts in portrait and landscape orientation. Alps offers only one font cartridge, equivalent to the HP B font cartridge, and no third-party font cartridges are available.

The LPX600 passed most of NSTL's PCL compatibility tests but stumbled on two counts. The device failed to call macros defined in HP's PCL, and it failed to print

EXECUTIVE SUMMARY

ALPS LPX600

Laser printer

Excellent print quality and a compact design make the LPX600 alluring. But the LPX600 is one of the slowest printers reviewed, and its paper-handling features are limited.

	POOR	FAIR	GOOD	EXCELLENT
Standard features			●	
LaserJet compatibility			●	
Speed	●			
Print quality				●
Paper handling	●			
Typographic features			●	
Overall value		●		

some downloaded fonts generated by PCL commands. However, neither problem is likely to occur during everyday office use.

The Alps LPX600 may be adequate for personal use where demand for paper capacity and speed are secondary to a desire for top-notch print quality. But in the long run, the lack of third-party accessories makes other printers a better buy.

Qume CrystalPrint Series II

At $1999, the Qume CrystalPrint Series II is the least expensive of the six printers considered here. It's also the smallest and lightest, thanks to its compact Casio liquid crystal shutter (LCS) print engine.

Physical differences aside, the printer's standard features compare closely to the LaserJet's. The device comes with 512K of memory, expandable to 1.5MB. No emulation modes are included, but users can purchase optional emulation modes on plug-in cartridges. The CrystalPrint passed all NSTL LaserJet compatibility tests with flying colors.

During NSTL speed tests the CrystalPrint exhibited a dual personality. As might be expected of a 6-ppm printer, it performed poorly on long text documents. But it beat out the 12-ppm Toshiba PageLaser 12 and

The sleek Alps LPX600 comes packed with soft fants far extra value. However, the 6-ppm engine is slaw and has limited paper handling capabilities.

the 10-ppm C.Itoh LIPS II when printing a *PageMaker* newsletter and a high-density *1-2-3* graph. This discrepancy suggests that the CrystalPrint's controller is optimized for graphics. In fact, only the Brother HL-8 outpaces it on complex graphics.

Print quality isn't on a par with the LaserJet's. For example, the CrystalPrint's tendency to dirty the page with toner required some adjustment of the print density control dial. Fine lines, particularly horizontal lines, were not as sharp as the LaserJet's. The CrystalPrint managed to better the LaserJet on one point: Its blacks were dense, with

The bargain-priced, compact Qume CrystalPrint Series II is a whiz at graphics printing, but its print quality and paper handling are below par.

PIERRE-YVES GOAVEC

EXECUTIVE SUMMARY

Qume CrystalPrint Series II

Laser printer

Surprisingly fast graphics printing speed and rack-bottom pricing make this diminutive $1999 printer stand out. However, obtaining acceptable text output requires fiddling with density contrals, and fine lines are imprecisely printed. Limited paper handling and a lack of accessories further reduce the CrystalPrint's appeal.

	POOR	FAIR	GOOD	EXCELLENT
Standard features			●	
LaserJet compatibility				●
Speed		●		
Print quality		●		
Paper handling	●			
Typographic features			●	
Overall value		●		

none of the LaserJet's tendency toward ghosting.

The care and feeding of the CrystalPrint is a regular household chore. You must replace toner as often as every 1000 pages, and the input bin holds a mere 100 sheets of paper. There's no separate manual feed tray, so the machine can't accept single sheets of letterhead or envelopes. Like the Alps LPX600, the CrystalPrint doesn't accept third-party accessories, including HP font cartridges, and has only seven optional HP-equivalent cartridges.

You can't beat the Qume CrystalPrint's $1999 price. But recognize that the printer's drawbacks—subpar output quality, inadequate paper handling, and no upgrade path—make it unsuitable for more than casual personal use.

Toshiba PageLaser 12

Among laser printer workhorses, the Toshiba PageLaser 12 is a Clydesdale. It churns out long text documents at a steady 12 pages per minute. Optional sheet and envelope feeders enable it to print 750 pages or 100 envelopes at a stretch.

But a good beast of burden never comes cheap. Without accessories, the PageLaser 12 costs $3799, but all the extras swell the price to $7044. Even so, mailing houses and busy offices with networks will find the PageLaser a better buy than the LaserJet Series II. (Potential buyers should compare the PageLaser to the LaserJet IID, which promises similar features but was unavailable for review at press time.)

At 600,000 pages, the Toshiba print engine is rated for twice the life span of the Series II's Canon LBP-SX. But that's just its first life—an optional service kit purports to extend engine life to 1.2 million pages. Toshiba rates the PageLaser's duty cycle at 25,000 pages per month—five times that of the Series II.

As expected, the PageLaser topped all comers in speed tests for text-intensive documents, beating the LaserJet by a long shot. But in tests involving graphics, the LaserJet, the Brother HL-8, and the tiny 6-ppm Qume CrystalPrint beat the PageLaser overall.

The PageLaser's print quality matches the LaserJet's, including some problems with

EXECUTIVE SUMMARY

Toshiba PageLaser 12

Laser printer

This expensive workhorse sets a fast pace; it whips out text as befits a 12-ppm print engine, and it deals cut sheets and envelopes with equal facility. Herculean durability guarantees long-lasting, dependable service. Despite a few minar LaserJet incompatibilities, this is a gaad choice for companies with heavy-duty printing needs—and a big budget.

	POOR	FAIR	GOOD	EXCELLENT
Standard features				●
LaserJet compatibility			●	
Speed			●	
Print quality			●	
Paper handling				●
Typographic features			●	
Overall value			●	

ghosting. The PageLaser produces sharp, crisp fine lines and gray shade patterns that are particularly distinct.

To go along with its impressive paper handling, the printer adds a solid lineup of typographic features. It comes with Courier, lineprinter, and Prestige Elite fonts. Each font is available in portrait or landscape, bold, italic, half size, double size, halftone, and reversed image, for a total of 216 combinations per font. The PageLaser doesn't support HP font cartridges, but Toshiba sells an extensive line of font cards for the printer. Standard emulations in the PageLaser include HP LaserJet 500 Plus, Diablo 630, Qume Sprint 11, and IBM Graphics Printer.

NSTL PCL compatibility tests indicated problems using nested macros and an inability to print some soft fonts downloaded with PCL commands. But neither problem is likely to occur with off-the-shelf application programs.

Is the Toshiba PageLaser 12 a better buy than the LaserJet Series II? Yes, if an organization needs to whip out pages at 12 ppm and if it uses 750 or more sheets of paper a day. But like any workhorse, the PageLaser is only worth its oats if it's kept busy. Its slow graphics printing and potential problems with PCL compatibility may also give some buyers pause.

Printing text at 12 ppm, the Toshiba PageLaser 12 is a speed demon built to move a mountain of paper.

The C.Itoh LIPS II delivers fast text printing and heavy-duty paper handling, but Series II compatibility flaws and inability to print envelopes limit its functionality.

C.Itoh LIPS II

The $3545 C.Itoh LIPS II enters the ring as a heavyweight—it's an 82-pound hulk, it's fast on its feet at 10 ppm, it communicates in complete phrases on a 40-character LCD display, and it's intelligent enough to twist fonts into a variety of shapes. The LIPS II's Konica print engine is rated for durability at 600,000 pages, twice that of the Canon LBP-SX engine. But this contender has two Achilles' heels: LaserJet compatibility problems and limited paper-handling features.

In NSTL compatibility tests, the printer had trouble reproducing *1-2-3* graphs and a *WordPerfect 5.0* document using LaserJet drivers. It also revealed unique problems with PCL escape sequences—it could reproduce only 12 fonts per page, compared with 16 for all other printers.

Despite the occasionally flawed output, print quality compares favorably with the LaserJet's. Text is sharp and well defined. Blacks are dense and consistent. However, fine lines and very light gray shades in graphics tend to print too lightly, and there is no print density control to compensate.

The LIPS II is the second-fastest text printer tested, offering a slight improvement on the LaserJet's text-printing speed. But the printer performs poorly on graphics printing.

PIERRE-YVES GOAVEC

EXECUTIVE SUMMARY

C.Itoh LIPS II

Laser printer

The LIPS II is a pricey hulk with impressive text printing speed, numerous typographic extras, and an exceptional central panel. But the LIPS II doesn't print envelopes and, worst of all, trips on PCL compatibility. At $3545, this printer is expensive without offering major advantages.

	POOR	FAIR	GOOD	EXCELLENT
Standard features				●
LaserJet compatibility	●			
Speed			●	
Print quality			●	
Paper handling	●			
Typographic features				●
Overall value			●	

The LIPS II improves slightly on the LaserJet's paper tray capacity. Holding 250 sheets, however, the input tray doesn't add the extra capacity that a busy office or active network needs. And the printer doesn't print envelopes. C.Itoh has no accessories to remedy either shortcoming.

To its credit, the LIPS II offers a wealth of typographic extras. Its emulation modes include Epson FX-80, Diablo 630, and IBM Proprinter XL, which should meet most demands. The printer contains 92 resident bitmapped fonts that correspond to fonts contained in HP cartridges A through T. Six additional fonts can be scaled from 6 to 40 points, slanted, rotated, and boldfaced. This flexibility is impressive, but software support for these extras is limited, and setting escape codes to customize fonts can be laborious.

The LIPS II offers an abundance of fonts, a model control panel, and a solid engine, but even if LaserJet compatibility problems are corrected, the LIPS II doesn't offer extra speed or paper-handling talents to justify its high price.

The Envelope, Please

Is there a compelling reason to choose an alternative to the LaserJet?

The answer is no, if the alternative is the Alps LPX600 or the Qume CrystalPrint Series II. Both printers are inadequate for more than personal use—the Alps because of its paltry paper-handling features and the Qume because of its inferior output quality. If you can afford $2695, the LaserJet is a better deal even for casual use.

If you have bottom-line responsibility for the productivity of a large or busy office, you should consider the Toshiba PageLaser 12 or the LaserJet IID. The other contender in this category, the C.Itoh LIPS II, doesn't offer a significant speed advantage and has no accessories to boost its limited paper-handling abilities.

Of the two printers that mimic the LaserJet, only the Brother stands out. The QMS Kiss Plus falters due to its LaserJet incompatibilities and slow graphics printing. The Brother HL-8 is an excellent alternative, offering more standard memory, a bigger array of resident fonts, higher speed, and useful emulation modes. It combines features, superior performance, ease of use, and low price to earn *PC World*'s Best Buy rating. The Brother's high standard just goes to show that, despite its limitations, the LaserJet Series II is a tough printer to beat. ●

Daniel Miles Kehoe is a product manager at The Printer Works, a laser printer retailer in Hayward, California.

NSTL BENCHMARK TESTING

The exclusive test facility for *PC World*, **National Software Testing Laboratories (NSTL)**, is an independent organization that specializes in evaluating personal computer hardware and software. A recognized pioneer in state-of-the-art test design, **NSTL** believes that the most useful benchmark tests measure how well products perform when executing typical business tasks. **NSTL** testers follow detailed test plans that simulate normal operating conditions. A controlled testing methodology ensures objective, accurate, and consistent results and gives consumers a sound basis for making purchase decisions. **NSTL** publishes its test results in *Software Digest Ratings Report*® and *PC Digest*.™ Neither publication accepts advertising. **NSTL** is located in Philadelphia, Pennsylvania.

ALPS LPX600
ALPS America
3553 N. First St.
San Jose, CA 95134
408/432-6000
List price: with 512K RAM $2175, with 2MB RAM $2795
Accessories: 1.5MB memory upgrode $720, legal-size paper cassette $55, faceup paper tray $20, font cartridges $175 eoch, toner kit $57, photoconductor cartridge $225.40, developer cartridge $107
Warranty: one year parts and labor
Extended warranty: yes
Technical support: unlimited, toll-free number, M–F 8:30–5:30
Other support services: technical bulletins ovailable from deolers and distributars
For more information, circle 620 on reader service card.

Brother HL-8
Brother Int'l Corp.
Information Systems Division
8 Corporate Pl.
Piscotaway, NJ 08855-0159
201/981-0300
List price: $2895
Accessories: 1MB memory upgrade $495, 2MB memary upgrade $995, legal-size paper cassette $99, taner cartridge $130
Warranty: one year parts and labar
Extended warranty: varies; available through dealer
Technical support: unlimited, tall-free number, M–F 9–4:30
Other support services: nane
For more information, circle 621 on reader service card.

C.Itoh LIPS II
C.Itoh Electranics, Inc.
2505 McCabe Way
Irvine, CA 92714-6297
714/660-1421
List price: with 512K RAM $3545, with 2MB RAM $4495
Accessories: 2MB memory upgrade $1695, legal-size paper cossette $55, letter-size paper cossette $55, font cartridges $150–$250, toner $180, drum cartridge $265
Warranty: ane year parts and lobar, on-site
Extended warranty: ane year parts and lobor an-site, $695 far 512K versian, $795 for 2MB versian
Technical support: telephone suppart $50 per haur, tall-free number, M–F 7–5
Other support services: 24-haur an-line bulletin board, nat tall-free
For more information, circle 622 on reader service card.

QMS KISS Plus
QMS, Inc.
One Magnum Pass
Mabile, AL 36618
205/633-4300
List price: $2195 base (Personality Card required)
Accessories: Personality Card 10 (512K RAM, Epsan FX-80, Diabla 630, Qume Sprint 11, and ANSI X3.64 emulations) $495, Persanality Card 20 (1MB RAM, Persanality Cord 10 emulations plus IBM Praprinter and HP LaserJet Series II) $795, Persanality Card 30 (2.5MB RAM, Persanality Cord 20 emulations plus HP 7475A plotter) $1595, legal-size paper cassette $75, letter-size paper cassette $75, B5-size paper cassette $75, envelape cassette $89, fant cartridges $249–$299, taner cartridge $130
Warranty: ane year (or 60,000 pages) parts and labar
Extended warranty: through service center $192 per year, an-site $430 per year
Technical support: unlimited phone suppart, no tall-free number, M–F 7–7
Other support services: nane
For more information, circle 623 on reader service card.

Qume CrystalPrint Series II
Qume
500 Yosemite Dr.
Milpitas, CA 95035
408/942-4000
List price: $1999
Accessories: 1.5MB memory upgrade $599, legal-size paper cassette $69, letter-size paper cassette $69, B5-size paper cassette $69, font cartridges $139–$279, taner kit (three-cartridge set) $99, drum cartridge $129
Warranty: ane year parts and labar at service depat ar 90 days ports ond labar at customer site via service agency
Extended warranty: available thraugh dealer
Technical support: unlimited phone suppart, no tall-free number, M–F 8–5
Other support services: nane
For more information, circle 624 on reader service card.

Toshiba PageLaser 12
Tashiba America, Inc.
Infarmation Systems Divisian
9740 Irvine Blvd.
Irvine, CA 92718
714/583-3000
List price: $3799
Accessories: 1.5MB memary upgrade $799, legol-size paper cassette $129, two-bin sheet feeder $999, envelape feeder $999, paper jagger/callator . $299, fant cartridges $149–$299, taner (six-pack) $169, drum cartridge $299, developer kit $219, fuser $129
Warranty: ane yeor parts and labar
Extended warranty: nane
Technical support: unlimited phane suppart, tall-free number, M–F 8–5
Other support services: an-line bulletin baard, na tall-free number
For more information, circle 625 on reader service card.

Ventura Turns Two

Ventura just gets better and better—

but now it's been split into a base version and a hefty add-on that total a steep $1500.

Steve Roth

When *Ventura Publisher* first appeared in 1986, it was hailed as the new *1-2-3*. Two years later *Ventura* is still top dog, and it's clear from this latest upgrade that the program's designers have listened to the publishing masses. How Xerox delivers the goods, however, may strike some as schizoid at best.

For $895 ($100 if you're moving up from *1.1*) you get *Ventura 2.0*, a solid, incremental upgrade that expands on the basic program rather than jumping into new realms. The *Professional Extension*—a 2.0-specific add-on priced at $595—includes the goodies desktop publishers have been lusting for: a slick table generator, full expanded-memory support for large documents, and dictionary-based hyphenation, plus an equation processor and vertical justification. Hot stuff, to be sure, but *Ventura* faithful may rightly ask why these features weren't built into *2.0*—or why there's no bargain upgrade for registered users.

Ventura 2.0: Making a Good Thing Better

Still, it's hard to find fault with version 2.0. You get a better-organized menu system, context-sensitive help, Bitstream's *Fontware* system and several typefaces (a $600 value), the ability to import TIFF files, style sheet printouts, multichapter numbering, and on-the-spot tracking. Yet for all of this, *Ventura 2.0* runs only about 10 percent slower and is still quite usable on an XT-class computer. Your system will need 640K of RAM and, if you're using a LaserJet, at least 4.5MB of disk space to accommodate *Ventura*, *Fontware*, and Bitstream fonts.

Long-document publishers take note: Although version 2.0 handles huge documents far more reliably than version 1.1, it can't store them in expanded memory to speed performance. On the plus side, *Ventura* flags you if it's running out of RAM and needs more disk space to work with a file, and it no longer limits the number of paragraphs per chapter.

Little Things Add Up

Detailing *Ventura*'s 70-plus enhancements would fill a book. The most important changes:

Style sheet and file manipulation. Ventura now produces style sheet and tag reports and will even generate a text file that can be printed out in a sharp-looking *Ventura* form.

But that's about it. You can't merge two style sheets or list the chapters that use a given style sheet. File handling, alas, remains rudimentary. If you want to view, copy, and delete files easily, turn to SNA's *VP Toolbox*.

Fonts. If you're stuck with a LaserJet but yearn for PostScript power, you're in luck. Bundling *Fontware* with *Ventura* means you can now generate printer fonts and matching screen fonts from 6 to 72 points for a number of displays and printers. Installing *Fontware* and building fonts from Bitstream's outlines is a simple menu-driven process. Just keep in mind that you can't scale fonts on the fly à la PostScript but must create them in advance. *Fontware* can build a font in a few minutes; constructing a respectable library can take literally all night.

Kerning and tracking. Automatic kerning was introduced in version 1.1, but the program included the kerning pair values only for PostScript printers. Version 2.0 includes width information for LaserJet fonts as well and adds a handy feature for interactively controlling kerning and tracking for any selection of text. You simply select the desired characters in text editing mode, hold down the <Shift> key, and press <Cursor Right> or <Cursor Left> to tighten or expand character spaces. (Similarly, you can change point size by pressing <Cursor Up> or <Cursor Down>.) Because *Fontware*'s screen fonts match their printed equivalents more closely than most third-party fonts do, you won't have to print as many test pages to get the kerning and tracking right.

Special items and effects. You can now treat a frame like a character and anchor it anywhere in a paragraph—useful for inserting logos, drop caps, and other small graphics. The ability to rotate text is another nifty extra, although you're limited to 90-degree increments and to one rotation per page with the LaserJet. But you can edit the rotated text and even adjust its column width.

Graphics. The big it's-about-time change: *Ventura* now accepts gray-scale and line-art TIFF files. (This enhancement also allows you to view, manipulate, and print EPS files

MARC ROSENTHAL

that include matching TIFF image files.) If you're using a PostScript printer, you can fine-tune the output by controlling screen frequency (halftone cells per inch), and the angle and shape of the halftone cells (dot, line, ellipse, or custom). *PageMaker 3.0*–like brightness and contrast controls, however, are lacking.

Manipulating images is certainly simpler with version 2.0. Clicking a graphic selects both the graphic and its frame. You can also add a frame in graphics mode, and flip through stacked graphics by holding down the <Ctrl> key and clicking the mouse. Image editing is easier, too. For example, you can now drag a picture around in the frame even if scale factors aren't set, and crop the image by moving part of it beyond the frame boundary.

In short, Xerox has filled a lot of wish lists. But you'll notice some irritating omissions. For example, *Ventura* still lacks an undo function; keyboard shortcuts are limited; and there's no *PageMaker*–like grabber hand for moving pages around quickly. The program won't scroll automatically when the mouse pointer hits the edge of the window, which makes manipulating elements a te-

FEATURES EVALUATION

The New Ventura: Bigger, Better, and Pricier

Ventura 2.0 and the Professional Extension stack up well against Interleaf Publisher—for $1000 less.

● Yes
○ No

	Interleaf 3.0	Ventura Publisher 1.1	Ventura 2.0/ Professional Extension
Pagination and layout controls			
Style sheets/templates	●	●	●
Table generator	○	○	●
Adjustable widow and orphan control	●	●	●
Automatic column balancing on last page	●	●	●
Vertical justification	●	○	●
Automatic table-of-contents generation	●	●	●
Size and position subscripts/superscripts	●	○	●
Cross-referencing	●	○	●
Typographic features			
Automatic kerning	○	●	●
Tracking control	○	●	●
Interactive tracking and kerning	○	○	●
Tracking by tag	○	●	●
Hyphenation dictionary	●	○	●
Reverse type	●[1]	●	●
Scalable font outlines	●	○	●
Prints style-sheet listings	○	○	●
Equation generator	○	○	●
Text/graphics handling			
Global search and replace	●	○	○
Automatic text flow around graphics	○	●	●
Isometric conversions	●	○	○
Freehand drawing	●	○	○
Rotates text	●	○	●
Shared content graphics	●	○	○
Contrast and brightness controls	●	○	○
Automatic spot color overlays	○	○	●

[1] Not automatic; must do manually.

dious job. Building tables is also a pain because *Ventura* still can't import and format native *dBASE* or *1-2-3* files or even .PRN files.

EXECUTIVE SUMMARY

Xerox Ventura Publisher Edition 2.0, Professional Extension

Desktop publishing software

Ventura 2.0 is a solid upgrade that adds TIFF support, *Fontware*, in-context help, and some nice extras typically found in third-party utilities. But it lacks full EMS support, a beefy table generator, and dictionary-based hyphenation—goodies that are supplied only with *Professional Extension*, an expensive 2.0 add-on.

	POOR	FAIR	GOOD	EXCELLENT
Pagination and layout controls				●
Typographic features				●
Text/graphics handling				●
Overall value			●	

Professional Extension

If all the features outlined above aren't enough, and you work with large documents every day, you're a candidate for *Professional Extension*—but call your banker first. If speed be your music, you'll need a 2MB EMS RAM board to store *Ventura* documents and the supplied Edco's hyphenation dictionary. *Professional Extension* also demands an extra 600K of disk space, plus 1.2MB for the dictionary.

Tables are every desktop publisher's nemesis, and *Professional Extension*'s table mode almost makes this onerous job easy. You insert a table in a *Ventura* document like any other special item, then build the grid with a few menu selections that specify the number of rows and columns, header lines, and ruling lines. You can size columns with the mouse or establish permanent column relationships, specifying, for example, that column A is always twice as wide as column B. Unlike a spreadsheet, *Professional Extension* can expand a cell to accommodate data, word-wrap the text, and expand the entire table downward.

Unfortunately, you'll also find some irksome lapses. The table generator will accept *1-2-3* and *dBASE* print files and properly align the data in columns, but it can't import *1-2-3* .WKS or .WK1 files or *dBASE* .DBF files—typical sources for tabular data. Unlike Corel's *Tabin*, *Professional Extension* won't delete dollar signs, align parentheses, suggest tab settings, or assign generic tags for quick formatting. In spite of these oversights, the table generator will save serious *Ventura* users hours of work.

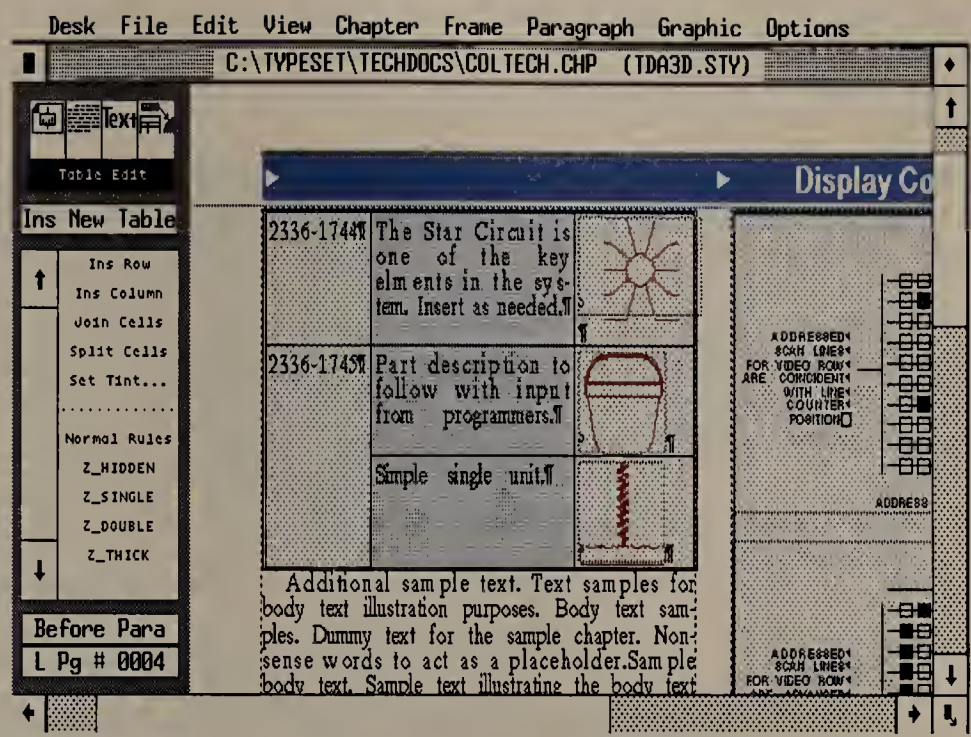
Professional Extension's other major claim to fame is its equation generator. This facility is a bit imposing at first, for you're faced with a formatting language that encompasses more than 100 commands and special words. But experimenting is so easy that you'll be typesetting integrals within an hour. Select the function, and *Professional Extension* splits the screen; type the syntax in the top window, and the equation is built before your eyes. The program doesn't set perfect equations automatically, but by changing font sizes, inserting thin spaces, and shifting elements around, you can get them right.

Professional Extension's cross-referencing tool also bears notice. You can insert references to a page, a figure, a table, a section, a chapter, a caption, or variable text, even across chapter boundaries. (Variable text acts as a placeholder and allows you to globally insert changes in seconds.) The only problem: You have to write down the references because *Professional Extension* won't print or display a list.

Paying the Price for Power

Splitting *Ventura* into two products won't please Xerox's customers—especially when crucial features such as a table generator and full EMS support are relegated to a $595 add-on. But dedicated *Ventura* users don't have many alternatives—*PageMaker* can't match these functions, and a heavy-hitting publishing program like *Interleaf Publisher* costs $2500 and requires a full 80386 system.

Once you make the investment, you'll find Xerox's duo about as easy to learn as *1.1*, thanks to a truly helpful help system, a more tightly designed interface, and hand-holding user manuals. *Ventura* is still a dream program—one that competitors will be chasing for some years to come. ●



Once you've created a table with Professional Extension, you can insert it into a document like any other special item.

Steve Roth is a Seattle-based freelance writer and the former editor of Personal Publishing.

WHERE TO BUY

Xerox Ventura Publisher Edition 2.0, Professional Extension
Xerox Corp.
Xerox Desktop Software
9745 Business Park Ave.
San Diego, CA 92131
800/822-8221
List price: version 2.0 $895, upgrade from 1.1 $100; Professional Extension $595 (no upgrade)
Requirements: 640K, with Edco dictionary 1.2MB of EMS RAM; DOS 2.1 or later version; hard disk; mouse; graphics board
Technical support: first 60 days free, no toll-free number, M–F 8–7
Other support services: newsletters, no phone support $50; newsletters, 6 hours of toll-free telephone support $150; unlimited telephone support, classes for volume buyers $2000
For more information, circle 650 on reader service card.

Tape Backup on a Budget

The distance between floppy- and tape-based backup is narrowing.

A new class of internal drives for under $600 lets you move up to tape without going to the poorhouse.

TJ Byers

When it comes to backing up data, PC users have been caught between the proverbial rock and a hard place. Disk-based backup is cheap but cumbersome and time-consuming, while fast, high-capacity tape backup systems can cost more than the computer itself. Fortunately, a new generation of streaming tape backup systems that use the palm-size DC2000 cartridge and conform to the QIC-40 standard has arrived. These devices create a welcome middle ground by offering removable cartridge convenience for less than $600.

In exchange for low price, however, QIC-40 tape drives sacrifice speed and capacity, making them poor choices for backing up a LAN server, a CAD workstation, or any system that holds mountains of data. Nonetheless, QIC-40 drives are a convenient and affordable solution for users who need to safeguard everyday data base, spreadsheet, and word processing files. Also, because QIC-40-format DC2000 cartridges written to by one drive can be read by any other manufacturer's, they lend themselves to the distribution of large files.

To help you decide if there's a tape backup system in your future, *PC World*, with the help of National Software Testing Laboratories (NSTL), evaluated five internal QIC-40 drives: the Alloy Retriever/40, the Archive-XL 5540, the Franklin Jumbo, the Mountain Filesafe TD4440, and the Tallgrass TG-1140. All claim to work with any PC-, XT-, or AT-compatible computer as well as with PS/2s. However, because PCs and XTs use a different controller than ATs, and because PS/2s prefer 3½-inch devices, the drives come in up to four models, depending on the specific size and controller support required.

We confined this roundup to internal drives for several reasons. One obvious benefit of internal devices is the desk space and electrical outlets you'll save. Another bonus: Internal QIC-40 tape drives don't require an additional controller if your system has only one floppy drive. You pay less than for external models, you don't give up a valuable expansion slot, and installation is a cinch. In most cases, all you need to do is remove the computer's cover and slide the drive into an available half-height bay. If you're a PS/2 owner, that's it; you're done with the hardware installation. For other computers you also need to tighten four screws to secure the drive, plug in a power cable, and connect the drive to the floppy controller with a provided cable. For each of the tape drives reviewed

here, installing the accompanying software is simple; all come with install programs that copy the required files to your hard disk.

The Real Power Behind the Drive

Differences in drive performance and features are largely a function of the included software. The programs in this review resemble their floppy-backup cousins (see "Fast Floppy Backup," *PCW*, January 1989). All include logical, easy-to-use menu interfaces with context-sensitive help screens; let you issue commands at the DOS prompt or within batch files; and perform both manual and prescheduled unattended backups of all, selected, changed, tagged, or hidden files.

One drive, the Mountain TD4440, can make image backups that, unlike file-by-file backups, create a mirror image of your hard disk on the tape. To retrieve a file from an image backup, you must restore the entire backed-up image—and while you're at it, go get a cup of coffee. However, image backups sidestep problems that occur when archiving copy-protected software.

All of the reviewed drives warn you before they write archived files over more current versions on your hard disk, identify and isolate bad sectors, and use error correction schemes that allow you to recover data from tapes damaged after backup. All but the Mountain TD4440 offer password protection, and only the ArchiveXL and Alloy drives fail to offer a security erase feature that removes any trace of sensitive data lingering on unused tapes.

All five drives allow backups that span multiple tapes, and since 3M introduced a 60MB version of the DC2000 in mid-1988, the reviewed drives equal the capacity of many costlier DC600 cartridge-based drives. At press time upgraded tape backup programs that allow QIC-40 drives to use the 60MB tapes were not available, but all of the reviewed drives should be shipping with the new software by the time you read this.

Starting with our Best Buy choice, the reviews that follow rank the five drives in descending order of overall value. We tested each drive in an AT compatible.

ALISON SEIFFER

ArchiveXL 5540

At $449, not only is the ArchiveXL among the cheapest drives in this roundup, it is also the fastest. That, along with easy-to-use software that includes a keystroke macro recorder, makes the ArchiveXL a *PC World* Best Buy.

Unlike the other drives reviewed, the ArchiveXL doesn't re-tension the tape when the cartridge is inserted, which means the drive is ready to use within 5 seconds, as opposed to the 2 minutes the other drives take.

EXECUTIVE SUMMARY

ArchiveXL 5540

BEST BUY

Faster than a speeding bullet, the ArchiveXL takes top honors for speed and convenience. Although not all commands are available from the menu, you can use a combination of menu and DOS-prompt commands in batch files.

	POOR	FAIR	GOOD	EXCELLENT
Performance				●
Security			●	
Backup/restore capabilities			●	
Overall value				●

The ArchiveXL is also the only drive with an eject button for easier cartridge removal.

The ArchiveXL has the only backup program reviewed that reports step-by-step what the drive is doing and how much time is left until completion. While status messages don't improve performance, they are nevertheless reassuring, considering how long operations such as tape formatting take.

The program's macro builder—a feature that none of the others offer—saves your keystrokes to a DOS file, allowing you to automate frequently repeated procedures. There is practically no limit to the number of keystrokes a macro can contain, and once created, it can be invoked with a single keystroke. You can create up to 17 macro files, and any or all may be added to an automatic schedule of operations or may run from the DOS prompt or a batch file. However, not all of the drive's features are available from a menu. For example, you can't verify a tape for readability before backup from the menu—only from the DOS command line.

All in all, though, you can't go wrong with the ArchiveXL. It consistently beat the competition in speed tests, and its few software shortcomings are more than offset by such extras as backup-status reporting and macros.

Tallgrass TG-1140

Tipping the scales at a moderate $495, the Tallgrass TG-1140 rates a solid second. While no speedster, placing fourth overall in performance tests, the TG-1140 comes with more software features than any drive except the Franklin Jumbo (both drives, and their included software, are manufactured by the same OEM, Colorado Memory Systems). Further, it's the only system to offer a three-year warranty.

Although the TG-1140's easy-to-use software can't record and play back your keystrokes, it has every other feature the ArchiveXL offers, plus security erase. However, menu selections are made using function keys, causing conflicts with *SuperKey* and ANSI.SYS, which modify the function keys. Another annoyance is the drive's unorthodox read/write head–positioning mechanism, which chatters like a toy machine gun when the system is powered up.

Overall, though, the TG-1140's excellent software and unique three-year warranty make it a serious contender for your backup dollar. Because it is an OEM item, discounted versions of the same drive can be found under a dozen other name brands, particularly through mail-order houses. But before you dismiss the TG-1140 in favor of a cheaper unit, consider the excellent warranty and technical support Tallgrass offers—they may be worth the extra dollars.

EXECUTIVE SUMMARY

Tallgrass TG-1140

While na speedster, the maderately priced TG-1140 offers more software features than any drive in this review. That, caupled with an extraordinary three-year warranty, places it a solid second.

	POOR	FAIR	GOOD	EXCELLENT
Performance			●	
Security				●
Backup/restore capabilities			●	
Overall value			●	

EXECUTIVE SUMMARY

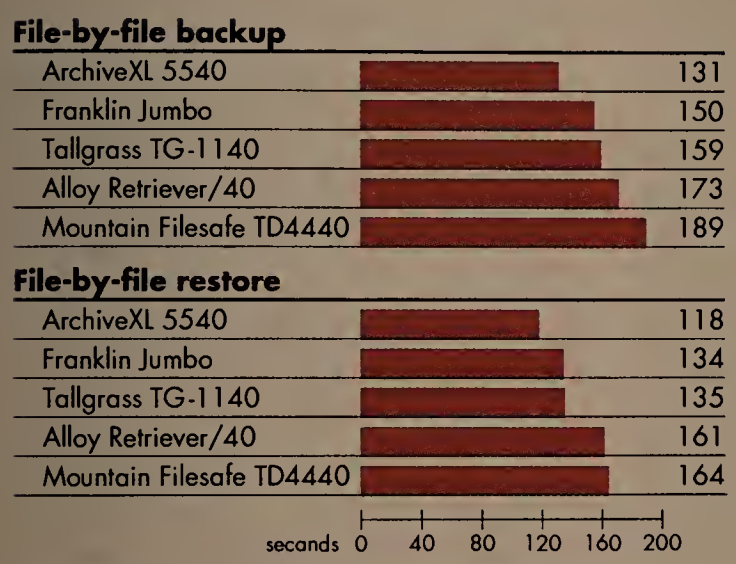
Franklin Jumbo

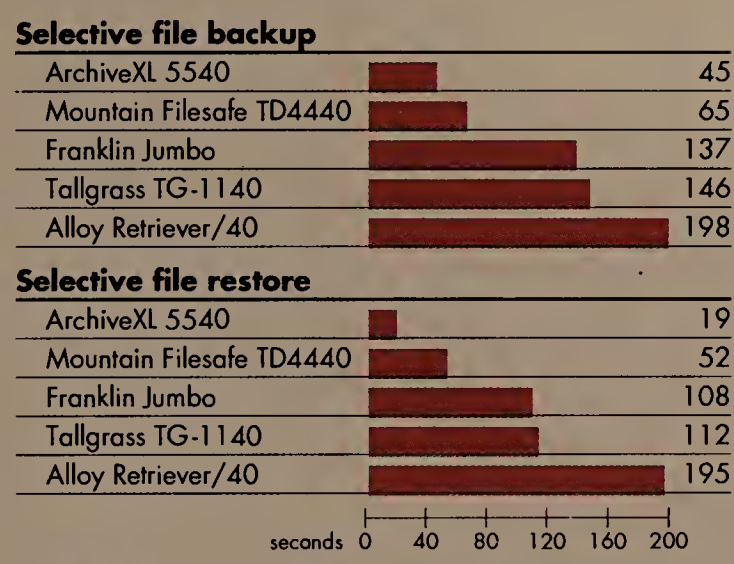
The Franklin Jumbo is identical in every respect to the Tallgrass TG-1140 except far price and warranty. Checking in at a law $430, the Jumbo lists far $65 less than the Tallgrass but offers anly a ane-year warranty.

	POOR	FAIR	GOOD	EXCELLENT
Performance			●	
Security				●
Backup/restore capabilities			●	
Overall value			●	

Tape Backup Drives

The ArchiveXL is the undisputed winner in the QIC-40 backup speed race. In selective file restores, the ArchiveXL is 10 times faster than the slowest drive, the Alloy Retriever/40.





All tape backup units were tested on an IBM PC AT Model 339 equipped with a 32MB, type 20 hard disk.

File-by-file backup
This test measured the time required by each system to back up 187 hard disk files. The test includes the time to rewind the tape to the beginning.

File-by-file restore
This test measured the time required by each system to restore the data backed up in the file-by-file backup test after the hard disk data was changed. Some files were deleted, some were modified, and new files were added. The test includes the time to rewind the tape to the beginning.

Selective file backup
This test measured the time required by each system to back up only those files that were modified or newly created since the last backup; it includes the time to rewind the tape to the beginning.

Selective file restore
This test measured the time required by each system to restore a specific set of files after a group of files was deleted, simulating a situation where a subset of files becomes unintentionally deleted. The test includes the time to rewind the tape to the beginning.

Data based on tests designed and conducted by National Software Testing Labaratories (NSTL). All rights reserved.

Franklin Jumbo

The Franklin Jumbo is identical to the Tallgrass TG-1140. Though at $430 it's the lowest-priced drive in this review, Franklin warrants it for only one year compared to Tallgrass's three.

To reduce inventory, Franklin dealers carry only two versions of the Jumbo. One is made for PCs, XTs, and ATs; the other for PS/2s. If you need another configuration (some Tandy machines, for example, accept only 3½-inch drives), Franklin dealers sell an $80 conversion kit, which pushes the total cost of the drive to over $500.

The Franklin Jumbo can also be ordered through several mail-order houses. If you choose this route, you can generally avoid the upgrade kit cost because most mail-order vendors carry a larger inventory than do local dealers. Just remember that you'll have to deal by mail should you have problems with the drive.

Mountain TD4440

The Mountain TD4440 is a pricey $595 drive that's not as quick as the others and lacks several important software features such as password protection, backup-status reports, and the ability to verify a tape for readability before backup. However, it is the only drive reviewed that offers image backup.

Despite NSTL's impressive selective-file-backup score for the Mountain, the system slows considerably when appending backup

FEATURES EVALUATION

Cheap, Dependable Tape Drives in the 40MB Zone

Although the five reviewed drives have a lot in common due to their adherence to the QIC-40 standard, some differences emerge, particularly when it comes to data security.

● Yes
○ No
◒ Deficient

	Alloy Retriever/40	ArchiveXL 5540	Franklin Jumbo	Mountain Filesafe TD4440	Tallgrass TG-1140
Security					
Verify tape	●	●	●	○	●
Password	●	●	●	○	●
Security erase	○	○	●	●	●
No archive bit change	●	●	●	○	●
Overwrite warning	●	●	●	●	●
Backup and restore capabilities					
Image backup	○	○	○	●	○
By file name or date	●	●	●	●	●
Hidden file	●	●	●	●	●
Restore to different directory or drive	◒[1]	●	●	●	●
Network support[2]					
IBM PC-NET	◒[3]	●	◒[3]	●	◒[3]
Token-Ring	●	●	◒[3]	●	◒[3]
3COM Ethernet	◒[3]	●	●	●	●
AT&T Starlan	◒[3]	◒[3]	◒[3]	●	◒[3]
Novell	●	●	●	●	●

[1] Restores only to current hard disk.
[2] Based on manufacturer claims.
[3] Manufacturer has not tested drive for compatibility with this network.

EXECUTIVE SUMMARY

Mountain TD4440

The TD4440 is a pricey drive that doesn't perform as well as less expensive drives. Although it does well in selective backup and restore tests, it is slowest in file-by-file testing. However, it's the only drive that offers image backup.

	POOR	FAIR	GOOD	EXCELLENT
Performance			●	
Security		●		
Backup/restore capabilities				●
Overall value		●		

files to a partially filled tape. The software must frequently rewind the tape to read the directory at its beginning. (The other drives reviewed read the directory but once.) Also, the TD4440 can't perform backups in read-only mode, which would prevent a restore operation from overwriting disk files with older versions of the same file.

Unique to the TD4440 is an optional $49.95 adapter cable that daisy-chains the drive to the floppy controller card and allows the TD4440 to work with two installed floppy disk drives. The other drives in this review require an adapter card—priced at about $100 or more—before they can coexist with two floppies.

The TD4440 is certainly a serviceable drive, and its software is easy enough to use. Moreover, Mountain Computer is likely to be there should you ever require warranty or technical help. But all in all, the drive delivers middling features and performance at a premium price.

Alloy Retriever/40

Last and least is the Alloy Retriever/40. It's the second most expensive drive reviewed, priced at $545, and the slowest. It was also the only unit that didn't work in one of my clones, which has an older Phoenix BIOS.

Hardware-wise, the Retriever/40 is unique among the reviewed drives: It's the only one that uses a belt-driven capstan to move the tape across the read/write head, rather than a conventional direct-drive stepper motor. While Alloy contends this arrangement leads to a cooler-running—and therefore more trouble-free—drive, there's no proof that it's any better or worse than direct drive, but it may be more prone to failure because the belt could break or wear out.

ResQ, Alloy's backup software, uses a complex combination of menu and DOS-prompt commands. Once you get the hang of it, it's the most flexible of the tape backup programs reviewed. It has some features the

others lack, like the ability to format a blank tape during a multiple-tape backup session. And it's the only program that supports a mouse.

However, ResQ is harder to use than the other software reviewed and forces you to go to the DOS prompt to execute certain commands. Having to use DOS-like commands in conjunction with the menus makes the backup and restore operations more confusing than they need to be. If your backup sequence is really complicated, you'd be better off programming the procedure into a batch file. You'll get more for your money with any of the other drives in this review.

EXECUTIVE SUMMARY

Alloy Retriever/40

The slow ond overpriced Retriever/40 is the poorest chaice among the drives reviewed. Although the included software has many feotures, including mouse support, it is canfusing and difficult to use.

	POOR	FAIR	GOOD	EXCELLENT
Performance	●			
Security			●	
Backup/restore capabilities		●		
Overall value		●		

Ready, Set, Back Up

The clear winner in this backup is the ArchiveXL because of its fast speed, low price, and macro capability. Running close behind are the Tallgrass TG-1140, with its three-year warranty and extensive list of software features, and the identical but cheaper Franklin Jumbo with its one-year warranty.

The middle ground belongs to the Mountain TD4440, whose only saving grace—image backup—doesn't make up for the drive's sluggishness and lack of features. And while the Alloy Retriever/40 has some unique software features and mouse support, it's hard to use and performs ten times slower than the ArchiveXL.

If the volume of your backups has made floppy-based systems a pain to use, chances are you won't do it. Low prices, a standard data format that lets you share data with coworkers, and hassle-free installation make QIC-40 a standard worth adopting. If you do, you'll be delighted to find that the best drive isn't always the most expensive one. ●

TJ Byers is a contributing editor for PC World.

WHERE TO BUY

ArchiveXL
Archive Corp.
1650 Sunflower Ave.
Casta Mesa, CA 92626
714/966-5589
List price: $449
Requirements: 256K, DOS 2.0 or loter version
Accessories: none
Warranty: ane yeor parts and labor, 48-hour service
Extended warranty: none
Technical support: toll-free number, M–F 7:30–5
For more information, circle 660 on reader service card.

Franklin Jumbo
Franklin Telecommunications Corp.
733 Lokefield Rd.
Westlake Village, CA 91361
805/373-8688
List price: $430
Requirements: 384K, DOS 2.1 ar loter versian
Accessories: PS/2 odapter kit $80
Warranty: one year parts and labor
Extended warranty: none
Technical support: no toll-free number, M–F 8–5
For more information, circle 661 on reader service card.

Mountain TD4440
Mauntain Computer Inc.
240 Haciendo Ave.
Campbell, CA 95008
408/379-4300
List price: $595
Requirements: 256K (640K recammended), DOS 2.1 ar loter versian.
Accessories: nane
Warranty: one year; drive replacement for the first six months, repoir aptian for the remainder af the worranty
Extended warranty: nane
Technical support: no toll-free number, M–F 8–4
For more information, circle 662 on reader service card.

Retriever/40
Alloy Camputer Products, Inc.
100 Pennsylvonio Ave.
Framingham, MA 01701
617/875-6100
List price: $545, $595 for PS/2 version
Requirements: 256K, DOS 2.1 ar later versian
Accessories: nane
Warranty: one year parts and lobor
Extended warranty: nane
Technical support: na tall-free number, M–F 8–5
For more information, circle 663 on reader service card.

Tallgrass TG-1140
Tallgrass Technalagies
11100 W. 82nd St.
Overland Park, KS 66214
913/492-6002
List price: $495
Requirements: 384K, DOS 2.1 ar later versian
Accessories: PC canversian kit $79, external cabinet with cable $179
Warranty: three years parts and labor
Extended warranty: nane
Technical support: tall-free number, M–F 8–6; aff-haurs answering service
For more information, circle 664 on reader service card.

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All you need is a corrupted disk with some valuable data stored aboard.

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determine the exact nature of the problem, report it and, in most cases, fix it for you.

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Automatically.

In fact, if the Doctor can't cure your corrupted floppy or hard disk, then Buster, you've got one corrupt disk.

In which case, you'll need to refer to *The Norton Troubleshooter,* a 158-page guide to finding and fixing most anything that could go wrong.

Don't worry, you don't have to go to the bookstore or the library to refer to it, because the Troubleshooter is included in the Advanced Edition.

Frankly, the Norton Disk Doctor and the Norton Troubleshooter are worth the price of the new Advanced Edition all by themselves.

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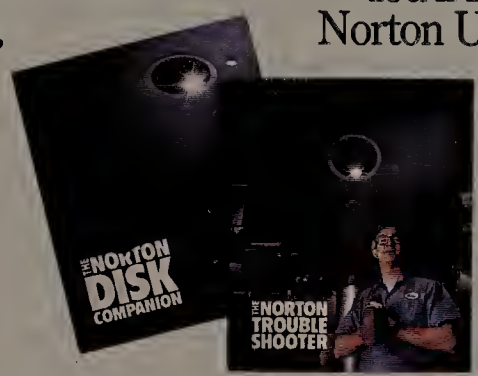

The Norton Disk Companion is included, free, with both the Standard and Advanced Editions. The Norton Troubleshooter is yours with the Advanced Edition.

And *Format Recover,* which can unformat your accidentally reformatted hard disk even if you haven't taken any precautions beforehand.

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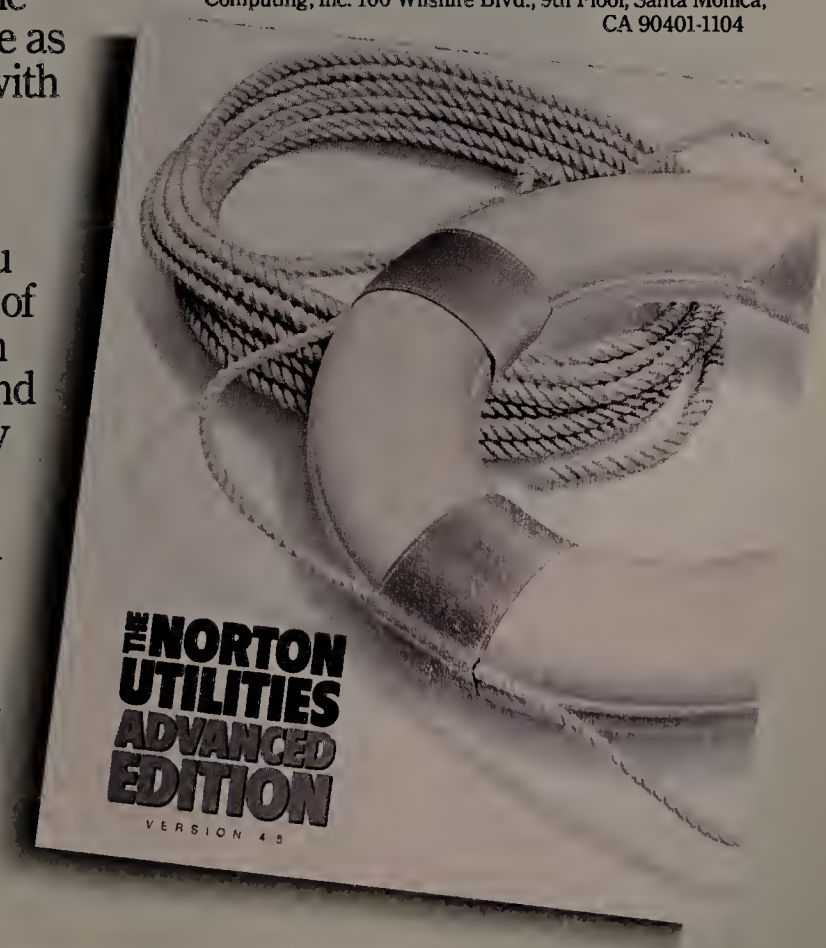
Peter Norton
COMPUTING

All Utilities now support large hard disks under DOS 4.0, COMPAQ DOS 3.31, and the PC-MOS/386 multi-tasking operating system. Designed for the IBM® PS/2® and PC families and 100% compatibles. ©1988 Peter Norton Computing, Inc. 100 Wilshire Blvd., 9th Floor, Santa Monica, CA 90401-1104



Circle 92 on reader service card

118 **ALR FlexCache 25386DT**
The fastest 386 machine we've ever seen costs considerably less than the Deskpro 386/25. There's just one crack in this clone's armor.

121 **AST Premium Workstation/286**
If desk space is a higher priority than performance or expansion capacity, AST knows how to keep a low profile.

123 **Mitsubishi MP 286L Model 220**
This inexpensive laptop-size transportable packs good performance, a 20MB hard disk, and a classy backlit display—but no battery.

124 **Logitech ScanMan, DFI Handy Scanner**
Two of the best hand-held scanners around turn photos and artwork into image files, then let you doctor the results.

128 **Alps Allegro 24**
Five bills gets you a slow-but-steady 24-pin printer that handles paper deftly and hardly ever jams.

The 25-MHz ALR FlexCache 25386DT isn't the cheapest 386 on the block, but it's the fastest one PC World tested.

ALR FlexCache 25386DT

25-MHz 80386-based computer

PROS: Top performance, large 32-bit RAM capacity, fast ESDI drive, six 8/16-bit slots

CONS: 80386-20 CPU, poor caching software, DIP switch setup

The fastest 80386 PC on the desktop is...no, not the Compaq Deskpro 386/25. At this writing, the fastest PC we've tested is the ALR FlexCache 25386DT. For those of you still in the dark, Advanced Logic Research is the company famous for being first—the first 80386 machine, the first clone of the Deskpro 386/20, and now, the first 80386 PC to nose past the Deskpro 386/25.

In raw processing speed, this beast beats Compaq's entry by close to 4 percent. Better yet, configured with 2MB of RAM, a 120MB high-performance ESDI drive, a VGA board and monitor, a 1.2MB floppy drive, one serial and one parallel port, and a 101-key keyboard, the 25386DT will run you $9738—nearly $2500 less than a similarly configured Deskpro 386/25, which comes with 10MB less hard disk space.

The 25386DT owes its impressive performance to a bit of inspired engineering. ALR has improved on the Intel 82385, the cache controller used by the Deskpro 386/25, the IBM Model 70-A21, and many other high-performance systems. Both the 82385 and ALR's work-alike circuitry manage a cache of superfast static RAM—fast enough for 25-MHz zero-wait-state operation.

The most important difference between the two controllers emerges when the CPU can't find the data it needs in the cache and resorts to main memory. The 82385 inserts a wait state, while ALR's emulation does not, resulting in faster main memory access than with systems that use the 82385.

Of course, you always pay for speed. Quicker access to main memory means ALR must use expensive, 60-nanosecond (ns)

JOHN GREENLEIGH

RAM chips instead of the Deskpro 386/25's slower, cheaper 100ns RAM. At this writing, 25386DT memory upgrades cost $895 per megabyte; a 1MB Compaq upgrade runs $549. And with room on the Deskpro's bus for 16MB of 32-bit RAM rather than the 25386DT's 14MB, the 386/25 may be better suited for some high-end applications.

From ALR's standpoint, one obvious benefit of emulating the 82385 is not having to buy Intel's chip, which is expensive and in short supply. But Intel 80386s rated at 25 MHz are also pricey and tough to procure. To get around the latter problem, some vendors run 20-MHz–rated 80386 chips at 25 MHz, a controversial practice known as "chip pushing" (see *Consumer Watch*, *PCW*, November 1988). Intel claims that pushed chips have a significantly shorter life expectancy and can even introduce calculation errors before they fail. Our policy is not to recommend systems with pushed CPUs.

It's easy to tell the speed at which Intel has certified a CPU to run—the chips are stamped at the foundry. In this case, the 25386DT's CPU should have been stamped "80386-25." Unfortunately, a heat sink was glued firmly to the top of the chip, making our routine examination of the CPU impossible.

ALR assured us that every 25386DT system contains a Intel 80386-25 CPU and that the heat sink was necessary to relieve heat buildup. And Intel departed from its usual tight-lipped policy to confirm that ALR had in fact ordered and received 80386-25 chips. That would have been the end of it—except that our technical editor persevered until he removed the heat sink, revealing an Intel 80386-20 chip. An ALR spokesperson averred that this was a "quality control" problem.

Mystery CPU aside, the 25386DT has been assembled with far more care than its cousin, the ALR FlexCache 20386 (see *The Hardware Shelf*, *PCW*, September 1988). The chassis is rock solid, and ALR has designed the motherboard from the ground up as a cache-based system. The unit has one 8-bit slot and a generous six 8/16-bit slots, one more 8/16-bit slot than the FlexCache 20386 tower. And although you can access only two drives from the outside, the 25386DT has a total of five half-height bays; the Deskpro 386/25 has only four.

The 25386DT's manual is also markedly superior to the 20386's, offering clear and complete instructions for peripheral installation and system configuration. However, as with most clones, system setup relies on DIP switches and the configuration utility is bare bones.

Bright spots include complete, menu-driven system diagnostics and peaceful coexistence with common application software. The NSTL Crash Test turned up a minor incompatibility problem due to the system's high speed. Switching the 25386DT to its slower 10-MHz clock speed provides a painless solution.

The worst part of the system software is the included disk-caching utility. It did so poorly that it caused the 25386DT to fall behind the Deskpro 386/25 by 24 percent overall. Rerunning the tests with *PC-Kwik*, the standard in disk-caching software, put the 25386DT back where it should be, about 7 percentage points ahead.

Clearly, the 25386DT is more than just another barnstorming clone. It's the product of engineering moxie, sensible pricing, and unfortunately, too much ambition. Although the unit is solidly built, the 80386-20 CPU—whether done by mistake or intentionally—reveals that ALR's desire to be first has a downside. Without the pushed CPU, this system would rate a Best Buy. As it stands, don't buy the 25386DT unless you check out the CPU, without the heat sink. —*Eric Knorr*

WHERE TO BUY

FlexCache 25386DT
Advanced Logic Research, Inc.
9401 Jeronimo
Irvine, CA 92718
714/581-6770
List price: Model R66 with 1MB of RAM, 66MB RLL hard disk, 1.2MB floppy drive, one serial and one parallel

FEATURES EVALUATION

From Portables to Blazing Desktops

The ALR FlexCache, the AST Workstation/286, and the Mitsubishi 286L laptop go up against three better-known systems. The Workstation/286 offers motherboard integration, while the 25-MHz FlexCache provides excellent expandability.

● Yes
○ No

	ALR FlexCache 25386DT	Compaq Deskpro 386/25	AST Premium Workstation/286	AST Premium/286	Mitsubishi MP 286L Model 220	Zenith SuperSport 286
Standard features						
Price	$9738 [1]	$12,146 [1]	$3805 [2]	$4790 [3]	$4593 [4]	$4857 [5]
CPU	80386	80386	80286	80286	80286	80286
Clock speed	25	25	6/10	6/8/10	12	12
Wait states	0	0	1	0	1	0
For laptops						
Weight (pounds)	n/a	n/a	n/a	n/a	17	18.8
Screen type	n/a	n/a	n/a	n/a	backlit CGA	backlit CGA
Complete documentation	●	●	●	●	●	●
Built into motherboard						
Parallel ports	○	○	1	1	1	1
Serial ports	○	○	2	1	2	○
Floppy disk controller	○	○	●	●	1	1
Video adapter	○	○	●	○	●	●
Mouse port	○	○	○	○	○	○
Coprocessor support	80387-20	80387-25, Weitek1167-25	80287-8	80287-8	80287-8 [6]	80287-8
Disk caching software included	●	●	●	●	●	●
Memory capacity						
Amount shipped with basic unit	1MB	1MB	1MB	1MB	640K	1MB
Memory bus capacity [7]	14MB	16MB	4MB	16MB	2.6MB	2MB
Expandability						
8/16-bit expansion slots/number free	7/4 [8]	5/3	2/2	6/4	4/2 [9]	3/3 [10]
8-bit expansion slots/number free	1/0	2/2	0/0	1/0	0/0	0/0
Half/full-height storage device bays [11]	5/2	4/1	2/0	5/2	n/a	n/a
300MB or larger hard disk available from maker	●	●	○	○	○	○
Ergonomic design						
Switchless setup	○	○	n/a	n/a	n/a	n/a
Compact footprint	○	○	●	○	n/a	n/a
Tilt-and-swivel monitor	○ [12]	●	●	●	n/a	n/a
Front-panel reset button	○	○	●	●	●	○
Front-panel on/off switch	○	○	●	○	○	○

[1] Price is based on the standard PC World configuration for high-end 80386 systems, which includes 2MB RAM, an ESDI hard disk (as close to 100MB as possible), a 1.2MB floppy drive, a VGA board and monitor, one parallel and one serial port, and a 101-key keyboard. The price for the Deskpro 386/25 includes a 110MB ESDI hard disk; the ALR FlexCache 25386DT has a 120MB ESDI hard disk. ALR does not supply VGA monitors, so the price for a VGA monitor was estimated at $500.

[2] Price based on 1MB RAM, 1.44MB floppy, 40MB hard disk, one parallel port, two serial ports, VGA, color monitor, 101-key keyboard, DOS 3.3, and GW BASIC.

[3] Price based on system configured as in footnote 2, except with 1.2MB floppy and one serial port.

[4] Price based on 640K RAM, 1.44MB floppy, 20MB hard disk, one parallel port, two serial ports, backlit LCD, RGB ports, 2400-bps modem, 86-key keyboard, carrying case, disk caching software, DOS 3.3, and GW BASIC.

[5] Price based on configuration as in footnote 4, plus battery and battery charger.

[6] Must buy model M286L-220VP.

[7] Includes all RAM accessible at CPU speed, whether on the motherboard or in special high-speed slots.

[8] If no special 32-bit memory board is present (which limits the machine to 1MB of memory bus RAM), the 32-bit slot doubles as an 8/16-bit slot, yielding a total of seven 8/16-bit slots.

[9] Proprietary slots; not AT compatible.

[10] Requires optional expansion unit.

[11] In most cases, two half-height bays can be converted to one full-height bay, and vice versa.

[12] Monitor available through dealers only.

port, 101-key keyboard $6490; Model 100 with 100MB RLL hard disk $6990; Model 120E with 120MB ESDI hard disk $7590

Accessories: 1MB 32-bit memory board $1249, 1MB RAM pack $895, 20-MHz 80387 math coprocessor $1199, VGA board $399, EGA board $299, 1.44MB floppy drive $225, 40MB tape backup $990, 150MB tape backup $1890

Warranty: one year parts and labor

Extended warranty: none

Technical support: no toll-free number, M–F 8 a.m.–10 p.m.

Other support services: none

For more information, circle 680 on reader service card.

AST Premium Workstation/286

AT-compatible system

PROS: Small footprint, integrated motherboard design

CONS: Limited expandability, mediocre performance

AST's Workstation/286 was designed at a time when diskless workstations seemed like the wave of the future. Fortunately, AST left two drive bays open. As a result, the Workstation/286 is now a reasonably priced, reasonably useful machine for settings where a small footprint matters more than top performance. At 10 MHz with one wait state, it runs 23 percent slower than its big brother, the zero-wait-state Premium/286—but it also costs $1000 less.

The Premium Workstation/286 measures just 15 by 16 by 3½ inches. A system with 1MB of 100ns RAM, one floppy drive (which, unlike those in other space savers, may be either a 1.2MB 5¼-inch or a 1.44MB 3½-inch), a 28ms 40MB Conner hard disk, a 101-key keyboard, a VGA board, and a VGA color monitor costs $3805. Budget-minded buyers can configure the system as a 512K, monochrome, diskless LAN station for $1785.

The motherboard holds up to 4MB of RAM, but that's the limit for RAM accessible at CPU speed. The machine uses inexpensive (but relatively slow) 100ns SIMMs, which is why the 10-MHz CPU has been throttled down to one wait state.

The I/O bus runs at 10 MHz with two wait states, which is roughly equivalent to the standard 8 MHz. Although there are only two expansion slots (compared to seven in the Premium/286), the highly integrated Workstation/286 reserves those slots for real expansion, such as an internal modem or a network board; one parallel port, two serial ports, a floppy controller, and a special connector for the Conner hard drive (which is designed with an on-board AT-type controller) are built right into the motherboard. You won't necessarily need to use a slot for a video adapter, either. Another special connector on the motherboard accepts proprietary VGA, EGA, or monochrome/CGA video adapters available from AST. (If you prefer, you can use a standard video adapter or hard disk controller in a standard slot.) There's also a socket for an 8-MHz 80287 math coprocessor.

As you might expect, the one-wait-state Workstation/286 trails the zero-wait-state Premium/286 in every NSTL performance benchmark. It boasts excellent software compatibility, however, passing the NSTL Crash Test without a single glitch.

With only two half-height drive bays, the Workstation gets poor marks for device expandability. Furthermore, the two 8/16-bit expansion slots require boards to be XT or XT/286 size; taller AT expansion boards won't fit.

On the other hand, peripherals and system extras are all impressive. The keyboard is excellent—a bit soft by IBM standards, but smooth and responsive. The VGA module and tilt-and-swivel monitor produce a bright, crisp display. The system comes with a set of first-class utilities, including a print spooler, disk-caching software, and an EMS 4.0–compatible expanded memory manager, as well as DOS 3.3 and GW BASIC. The documentation is clear and complete.

While the Workstation/286 is a likable-enough computer, offering the reliability that

Three Computers Face Their Rivals

ALR's 25-MHz FlexCache beat the Deskpro 386/25 across the board—just barely. AST's Premium Workstation/286 placed dead last in three events; Mitsubishi's MP 286L and Zenith's SupersPort 286 ran neck and neck in all but the dBASE test.

Microsoft Word

ALR FlexCache 25386DT [1]	48
ALR FlexCache 25386DT [2]	48
Compaq Deskpro 386/25	52
AST Premium/286	134
Mitsubishi MP 286L	147
Zenith SupersPort 286	150
AST Workstation/286	172

1-2-3

ALR FlexCache 25386DT [1]	84
ALR FlexCache 25386DT [2]	84
Compaq Deskpro 386/25	87
AST Premium/286	239
Zenith SupersPort 286	244
Mitsubishi MP 286L	253
AST Workstation/286	304

dBASE III Plus

ALR FlexCache 25386DT [2]	47
Compaq Deskpro 386/25	55
AST Premium/286	124
AST Workstation/286	157
ALR FlexCache 25386DT [1]	169
Zenith SupersPort 286	212
Mitsubishi MP 286L	462

seconds 0 60 120 180 240 300

AutoCAD

ALR FlexCache 25386DT [2]	44
Compaq Deskpro 386/25	44
ALR FlexCache 25386DT [1]	46
AST Premium/286	165
AST Workstation/286	176
Zenith SupersPort 286	n/a [3]
Mitsubishi MP 286L	n/a [3]

seconds 0 60 120 180 240 300

Microsoft C

ALR FlexCache 25386DT [2]	195
ALR FlexCache 25386DT [1]	210
Compaq Deskpro 386/25	211
AST Premium/286	541
Mitsubishi MP 286L	580
Zenith SupersPort 286	603
AST Workstation/286	672

seconds 0 120 240 360 480 600

[1] Tested using the disk cache supplied with the system, Control 386.
[2] Tested using third-party disk cache, Super PC-Kwik.
[3] No EGA adapter installed.

All machines except the Zenith and the Mitsubishi were tested with a coprocessor and a disk cache of 256K in extended memory for all but the *1-2-3* benchmark. The SupersPort 286 and MP 286L were tested with a disk cache of 64K in conventional memory. The ALR FlexCache was tested with a 120MB hard disk and 2MB of RAM. The Deskpro 386/25 was tested with a 300MB hard disk and 3MB of RAM. The AST Workstation/286 was tested with a 40MB hard disk and 1MB of RAM. The AST Premium/286 was tested with 3MB of RAM and a 44MB hard disk. The SupersPort 286 and MP 286L were each tested with 640K of RAM and a 20MB hard disk.

Microsoft Word 4.0
A *Microsoft Word* macro loads a 35-page, 140-paragraph document and performs search-and-replace and spell-checking operations. The first page of the document is then printed. Although the results of the benchmark depend primarily on processor and memory access speeds, display adapter and hard disk speeds are contributing factors.

dBASE III Plus 1.1
The *dBASE III Plus* test measures the time required to prepare and print a report of past-due invoices. The report includes calculated fields and is based on three files: a 500-record customer file, a 1000-record invoice file, and a 2000-record item file. When disk caching is not used, the random access speed of the hard disk is, after processor speed, the most significant factor in this benchmark. With disk caching, sequential read performance becomes more important than random access.

Microsoft C 5.0
The Microsoft C benchmark measures the time required to compile and link XLISP, a public-domain program composed of 25 C source code files. The most important factors in this benchmark are processor and memory access speeds. The performance of the hard disk is also a factor; generally, disk caching has little effect.

1-2-3 2.01
In this benchmark, a *1-2-3* macro executes a series of recalculations using five different formulas within a 75-by-75-cell matrix. Because there are few screen updates and no screen access is required, the results depend almost entirely on processing and memory access speeds.

AutoCAD 9
In this benchmark, a three-dimensional sample drawing is retrieved and displayed using *AutoCAD*'s EGA driver. The zoom function is used to display the drawing from various perspectives; then the full drawing is printed. The results of the benchmark depend primarily on the speeds at which the processor and coprocessor operate and at which memory is accessed. The performance of the display adapter and the hard disk also have some effect.

Data based on tests designed and conducted by National Software Testing Laboratories (NSTL). All rights reserved.

makes AST's expansion boards so popular, its unimpressive performance and limited expandability are two strikes against it. With faster, more expandable machines taking up little more desk space (and costing little more money), it's hard to get excited over a diskless workstation with disks even if it *is* only 3½ inches tall. —*Eric Grevstad*

WHERE TO BUY

AST Premium Workstation/286
AST Reseorch Inc.
2121 Alton Ave.
Irvine, CA 92714-4992
714/863-0181
List price: Model 100X with 512K RAM, no disk drives, 101-key keyboard $1445; Model 103X/105X olso includes 1.44MB 3½-inch or 1.2MB 5¼-inch floppy drive, DOS 3.3, utilities $1495; Model 123X/125X olso includes 20MB hord disk $2145; Model 143X/145X with 40MB hord disk $2495
Accessories: CGA/monochrome video module $145, EGA video module $300, VGA video module $300; monochrome monitor $195, color EGA monitor $695, color VGA monitor $695; 512K RAM upgrode (two 256K SIMMs) $315, 2MB RAM upgrode (two 1MB SIMMs) $1324
Warranty: one year
Extended warranty: availoble through dealer
Technical support: no toll-free number, M–F 8–5
Other support services: ovailoble through dealer
For more information, circle 681 on reader service card.

Mitsubishi MP 286L Model 220

AT-compatible transportable system

PROS: Light, inexpensive, excellent display

CONS: Slow disk, no AT-compatible slots, CGA graphics

The recent proliferation of fast, battery-powered, 286-based laptop computers with hard disk drives has made it possible to arrive at your destination having *finished* the work you were doing when you left. On the downside, a battery big enough to run a hard drive (and a backlit screen) for more than a few minutes weighs quite a bit, and lightweight components are not cheap.

Mitsubishi has cast its vote for portability, but against battery-powered operation, in the form of a low-cost, AC-powered, laptop-shaped transportable it calls the desktop/laptop 286L.

The 12-MHz 286L is lightweight in price as well as pounds: $4593 gets you a compact, 17-pound system with 640K of RAM, a 20MB hard disk, a 1.44MB 3½-inch floppy drive, an internal 2400-bps modem, a full complement of ports (two serial, one parallel, one external floppy disk drive), disk caching software, MS-DOS 3.3, GW BASIC 3.2, *and* a carrying case. The MP 286L is about 2 pounds lighter than the battery-powered Zenith SupersPort 286 and costs $264 less, but it performs significantly slower on disk-intensive applications.

The 286L's crowning glory is its large, readable, 9-by-6½-inch fluorescent backlit display. The display uses "neutrally twisted" liquid crystals to produce the high-quality black-on-white screen image (switchable to white-on-black). Unfortunately, the 286L's screen is only CGA compatible.

The MP 286L's 12-MHz, one-wait-state 80286 can be switched to 8 MHz—or even 6 MHz—with zero wait states via back-panel DIP switches. The I/O bus is also switchable, from 8 MHz to 6 MHz. Memory-bus RAM can be boosted to 2.6MB via a proprietary expansion board. The Mitsubishi provides four proprietary expansion slots, but two are required for a CGA video board and a modem. No AT slots are provided. An 8-MHz 80287 math coprocessor is available, but to get it you have to buy a different model, the MP 286L-220VP, for an additional $600.

The MP 286L is a fairly strong performer. Except for the disk-intensive *dBASE* benchmark, where its slow 68ms hard disk drags it down, it rates NSTL benchmarks very similar to those of the Zenith SupersPort 286—and even faster than the AST Workstation/286! Installing the 2MB memory board will let you create a RAM disk that speeds up disk-bound applications. The 286L demonstrates excellent software compatibility;

its only difficulty with the NSTL Crash Test was a major problem with *Microsoft Windows*—a failing that most laptops seem to share.

A major irritation with portables is non-standard keyboard layouts. The 286L's 86-key keyboard is not perfect, but it's as good as you'll find today. <Tab>, <Backspace>, <Enter>, <Shift>, <Caps Lock>, <Ctrl>, <Alt>, and all the alphanumeric keys are just where you'd expect them to be. The 286L *does* bow to its size limitations by locating <Page Up>, <Page Down>, <Insert>, <Delete>, <Break>, and cursor keys across the top—which takes some getting used to. The numeric keypad is embedded in the alpha keys and must be switched on with <Num Lock>.

If you need top performance on disk-intensive applications, you can pick up the Zenith SupersPort for only a few hundred dollars more and get battery-powered operation in the bargain. In addition, the Mitsubishi 286L's lack of AT slots and VGA graphics is cause to pause. Nonetheless, this laptop dynamo's low sticker price, light weight, and highly readable CGA display make convincing reasons to part with the necessary cash.
—*John Diebold*

WHERE TO BUY

Mitsubishi MP 286L
Mitsubishi Electronics America, Inc.
991 Knox St.
Torrance, CA 90502
213/515-3993
List price: 286L-210 with 640K RAM, two 1.44MB floppy drives, backlit LCD, disk caching software, DOS 3.3, GW BASIC 3.2 $3195; 286L-220 with 640K RAM, 20MB hard disk, 1.44MB floppy drive, backlit LCD, DOS 3.3, GW BASIC 3.2 $3995; 286L-220VP with 640K RAM, 20MB hard disk, 1.44MB floppy drive, 8-MHz 80287 math coprocessor, backlit LCD, DOS 3.3, GW BASIC 3.2 $4595
Accessories: 2MB memory expansion board $1530, 2400-bps modem $499, external 1.2MB 5¼-inch floppy drive $525, external 17-key numeric keypad $158, carrying case $99
Warranty: one year limited, parts and labor
Extended warranty: none
Technical support: available through dealer
Other support: none
For more information, circle 682 on reader service card.

Logitech ScanMan

Hand scanner

PROS: Sharp images, easy to use

CONS: Blind to red hues, limited to 200 dpi, no OCR support

DFI Handy Scanner

Hand scanner

PROS: 400-dpi capability, supports OCR

CONS: Some printer drivers don't work, slow 200-dpi scan speed, software awkward to use

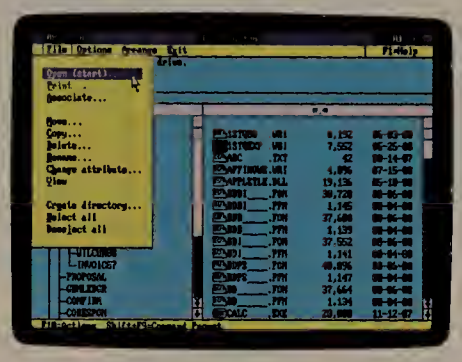
Just when you thought your desktop was safe again, you may have to clear away that clutter to make room for the latest in creepy crawlers: the hand-held scanner. This handy device (sorry!) costs less than $350, looks a bit like a toy Hovercraft, and lets you translate photos and artwork into digital-image files.

There are a few trade-offs, of course. Hand scanners can digitize only small images. Furthermore, you'll need a steady hand as you pass the scanner over the source image or text; if you tremble, you may have to start from scratch. Still, considering that a flatbed scanner like the HP Scanjet costs $1500, this is a great way to go scanner dipping without taking a bath.

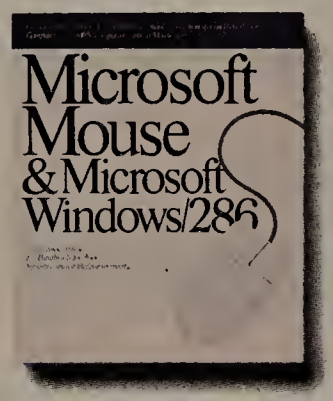
Two of the best new hand scanners on the market are Logitech's ScanMan ($299) and DFI's Handy Scanner HS-3000 ($329). What separates them from the pack is their 4⅒-inch scan width, which is relatively generous compared with the 2½-inch scan width typical of most other hand scanners. Of the two, Handy Scanner has more to offer in the way of features; ScanMan comes with better software and is easier to install and use.

Push your software to the limit.

If you want to get the most out of today's new, high-powered software applications, we have a few words of advice:
Use a Microsoft® Mouse.



The Microsoft Mouse gives you easy access to all the powerful features today's software has to offer.



It looks innocent enough here, but wait until you see how the Mouse makes your software scream.

The Mouse can unleash your software–and take full advantage of the features intended to make your work easier.

With the Mouse you can effortlessly manipulate menu-driven applications without taking your eyes off your screen. You can pull down menus. Highlight text in one fell swoop. Copy, cut and paste formulas in spreadsheets easily. And move things from here to there without any command-key mumbo jumbo.

Literally hundreds of applications support the Mouse. But as the leading software developer for personal computers (and one of the first to bring a graphical interface to PC screens), we've gone a step further: Microsoft Windows/286 with PC Paintbrush® for Windows, Microsoft Paintbrush or EasyCAD™2 actually come with the Mouse (or vice versa).

Already, the Microsoft Mouse has made its way into the hands of over one million personal computer users. And that number is sure to grow even faster. After all, graphically oriented software is the driving force behind improved productivity.

But it's the Microsoft Mouse that puts you in the driver's seat.

Microsoft®
Making it all make sense.™

©1988 Microsoft Corporation. All rights reserved. Microsoft and the Microsoft logo are registered trademarks and the Microsoft Mouse design and Making it all make sense are trademarks of Microsoft Corporation. EasyCAD is a trademark of Evolution Computing. PC Paintbrush is a registered trademark of ZSoft Corporation. For more information, call (800) 541-1261. Customers in Canada call (416) 673-7638, outside North America, (206) 882-8661.

Both DFI's Handy Scanner and Logitech's ScanMan scan a 4.1-inch width. Handy Scanner has more features; ScanMan's software works better.

Both units are a bit larger than a mouse and come with an interface board that slips into an 8-bit, half-length slot. Both provide a simple image-capture utility as well as full-feature image-editing-and-printing software, on-board hardware controls to set contrast and dithering, and an on/off switch located where your right thumb rests. Handy Scanner, which scans at several resolutions, has a slide switch for setting dpi; ScanMan offers only 200 dpi. Both units save scanned images to popular file formats like TIFF, .MSP, and .PCX for use in programs such as *PageMaker*, *Ventura*, *WordPerfect 5.0*, and *PC Paintbrush Plus*.

To scan an image, you load the software, hold down the scanner's on/off switch, and carefully pass the scanner over the artwork or text. Depending on your computer's clock speed, it takes 3 to 12 seconds to scan a 6-inch image with ScanMan. Handy Scanner takes about the same time at 400 dpi but is painfully slow at 100 and 200 dpi.

If you scan too slowly or too quickly, or set the contrast control too high or too low, the resulting image will be unusable. With both products you must experiment a fair amount in order to set scanning speed and contrast correctly, but Handy Scanner seems a bit harder to adjust.

Both units have a built-in scanning light: Handy Scanner uses yellow-green and ScanMan uses red. ScanMan's red monochrome seems to produce sharper images (at least at 200 dpi, the only resolution shared by both scanners), but it virtually blinds ScanMan to red hues. (You can compensate to some extent by adjusting the contrast.) Handy Scanner's yellow-green light reads all colors.

In the features department, Handy Scanner is a clear winner. It reads 32 gray levels and offers variable resolutions of 100, 200, 300, and 400 dpi. ScanMan reads only 16 gray levels and is limited to 200 dpi. In addition, Handy Scanner can read images up to 20½ inches long, while ScanMan is limited to 6 inches. Moreover, Handy Scanner supports OCR (optical character recognition), which means that by using optional software, you can transform scanned text into ASCII files to edit with your word processor. ScanMan lacks OCR capability.

In addition to minimal, easy-to-use image-capture utilities, both scanners come with full-feature software packages for editing scanned images. ScanMan gives you *PaintShow Plus;* Handy Scanner provides *Halo DPE*. Both of these programs enable you to rotate the captured image, add color, produce slides, and resize the area of interest. ScanMan's software is much easier to learn and use, however; it even includes a *Windows* utility that lets you export captured images into *Windows Paint*. Furthermore, the version of *Halo DPE* that came with Handy Scanner did not work properly with some printers.

Hand scanners are not yet professional production tools, but they serve well for certain small desktop publishing jobs. Which one should you buy? ScanMan, with its handy software package and easy operation, is probably the scanner of choice. On the other hand, if you *must* have OCR software, and you don't mind some rough edges, Handy Scanner makes sense. —*Alan Southerton*

JOHN GREENLEIGH

1024X768 IBM COMPATIBLE VGA VIDEO CARD

VGAWONDER™

THE SECOND WONDER

1024X768

Plus: VGA, EGA, CGA, MDA & Hercules on Standard MULTISYNC monitors

Yes! the Phenomenal VGAWONDER does it all at IBM Hardware level compatibility with automatic monitor detect and no dip switches or jumpers to set. A HOT CARD for the 286/386 POWER USER with AUTO BUS DETECT for 8 or 16 bit slots, running with a 16 bit datapath with 1:1 interleave. 100% IBM HARDWARE LEVEL COMPATIBILITY means that ALL software and operating systems designed for IBM systems will run. 1024 WILL BE DISPLAYED IN COLOR ON STANDARD MULTI-FREQUENCY MONITORS. Although these features are expected from ATI they are NOT AVAILABLE from other manufacturers. EGA on all monitors including RGB & TTL means a perfect card for networks. MOUSE ON BOARD! ATI built the mouse right in to this one, why not? No extra charge! VGAWONDER is available in both 512K and 256K Versions. Ask your dealer for more information.

ATI Technologies Inc.
3761 Victoria Park Ave., Scarborough, Ontario
Canada M1W 3S2 Telex: 06-966640 (ATI TOR)
Tel: (416) 756-0718 Fax: (416) 756-0720

Circle 302 on reader service card

ATI, VGA WONDER — ATI Technologies Inc.; Multisync — NEC Home Electronics Inc.; AUTOCAD — Autodesk Inc.; WINDOWS — Microsoft Inc.; GEM — Digital Research Inc.; VENTURA — Xerox Corp.; HERCULES — Hercules Computer Technology Inc.; IBM, VGA, EGA, CGA — International Business Machines Corp.

FEATURES EVALUATION

Two Hand Scanners

Logitech's ScanMan offers fewer features and resolution options than DFI's Handy Scanner but makes up for it in two areas not shown on the table: ease of use and software reliability.

● Yes
○ No

	ScanMan	Handy Scanner
Resolution		
100 dpi	○	●
200 dpi	●	●
300 dpi	○	●
400 dpi	○	●
Features		
Maximum scan length (inches)	6	20.5
Maximum gray levels	16	32
Maximum scan speed (inches per second)	.79	.79
Light source	red	yellow-green
Black-and-white line-art mode	●	●
Dithered mode(s)	●	●
Cable length (feet)	6	5.9
PS/2 model available	●	●
Software		
Basic image capture	●	●
Scan/paint/slide software	●	●
Microsoft Windows	●	○
OCR support	○	●[1]
Printers supported	50	22
File types supported		
TIFF	●	●
.MSP	●	●
.PCX	●	●
.IMG	○	●
.CUT	○	●

[1] Optional software required.

WHERE TO BUY

ScanMan
Logitech Inc.
6505 Koiser Dr.
Fremont, CA 94555
415/795-8500
List price (includes PointShow Plus, WinScan, and DOS command-line utilities): PC version (works with PS/2 Models 25 and 30) $299, PS/2 version $349
Requirements: one free exponsion slot, 384K (640K RAM minimum and mouse required to run PaintShow Plus), hard disk or two disk drives, DOS 2.1 or later version
Warranty: one yeor on hordware only
Extended warranty: none
Technical support: toll-free number, M–F 8:30–4:30
Other support: newsletter, 24-hour (seven doys o week) bulletin board
For more information, circle 683 on reader service card.

Handy Scanner
DFI Inc.
2544 Port St.
West Sacromento, CA 95691
916/373-1234
List price (with Holo DPE ond stond-olone imoge copture progrom): stan-dord PC version (including PS/2 models 25 ond 30) $329, PS/2 version $349
Accessories: standard OCR softwore $99, extended OCR software $295
Requirements: one free expansion slot, 384K (512K ond mouse required for Halo DPE), DOS 3.0 or later version
Warranty: one year on hardware only
Extended warranty: none
Technical support: toll-free number, M–F 9–6
Other support: none
For more information, circle 684 on reader service card.

Alps Allegro 24

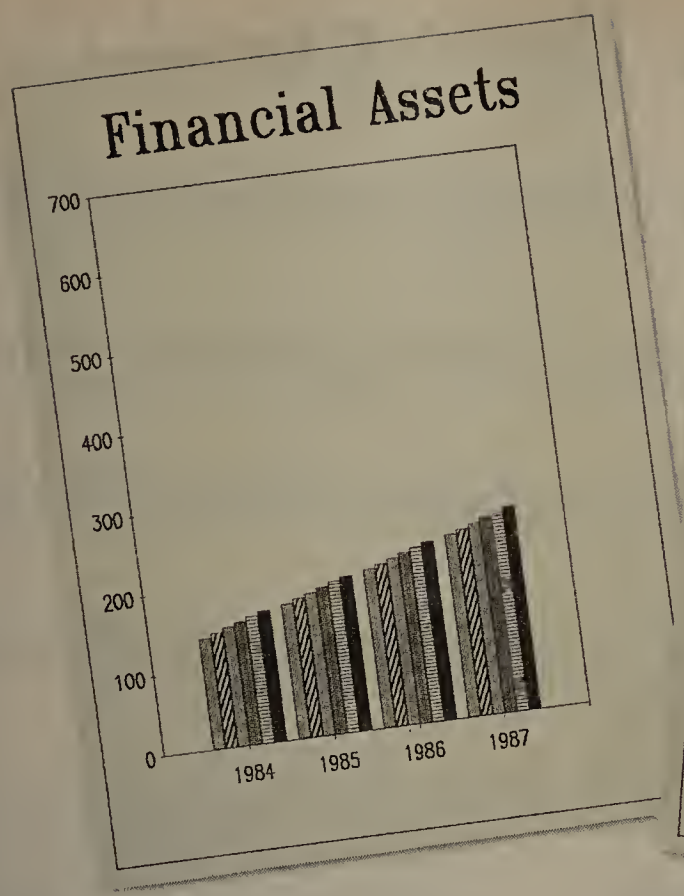
24-pin dot matrix printer

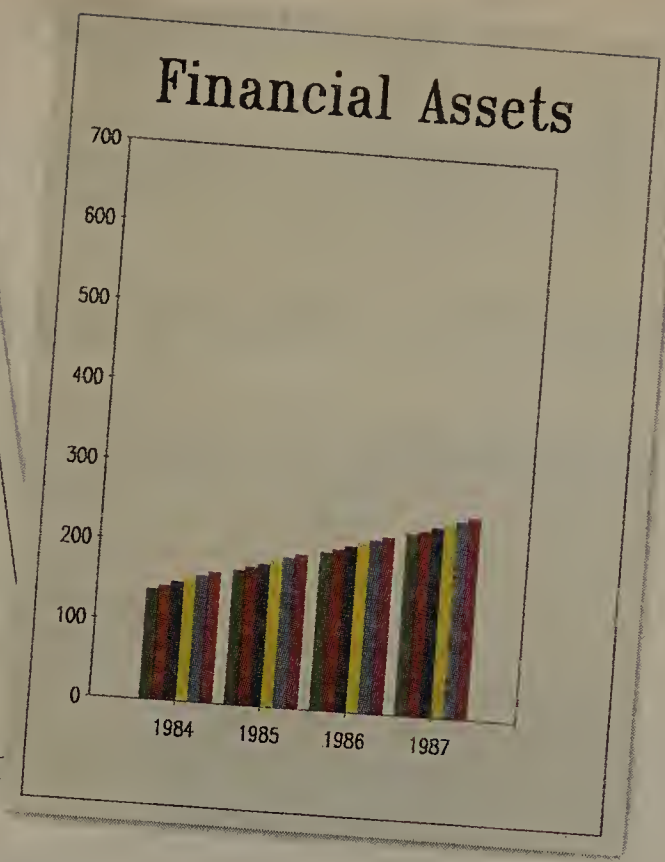
PROS: Flatbed poper path, excellent paper handling, very low price

CONS: Unimpressive print quality, slow

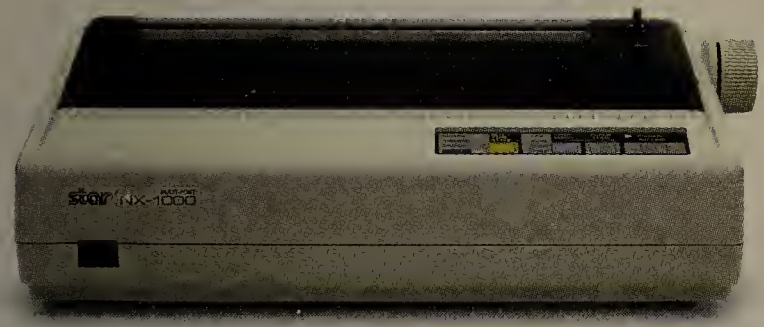
Like trying to find a good, inexpensive restaurant, the quest for a solid, inexpensive 24-pin dot matrix printer can be a stomach-wrenching experience. Now, Alps America has an extremely low-priced printer that ought to satisfy anyone's appetite for 24-pin output—as long as he or she doesn't mind slow service.

The $499 Allegro 24 is a narrow-carriage printer that features a unique paper path and top-notch paper handling. Compact and lightweight, the Allegro fits easily onto any desktop; you can even pack it under your arm for weekend duty. The price tag includes four resident fonts, a 7K buffer (expandable





Now you don't need impressive assets to get an impressive image.

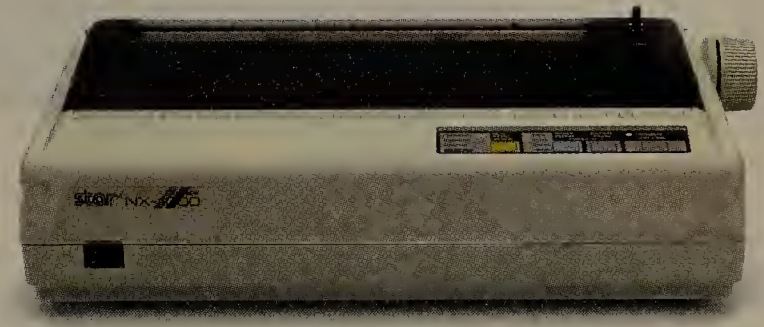


The new Star NX-1000 Multi-Font

This new dot matrix printer can do a lot for your image. For a lot less.

The NX-1000 Multi-Font gives you four built-in fonts and over 20 typestyles. It delivers draft quality text at 144 characters per second. High-resolution, near-letter-quality documents at 36 cps. And crisp, clear graphics.

You'll also find built-in friction and tractor feeds. An easy-to-use control panel that puts typestyles, print pitch and more at your command. And a paper parking mechanism that lets you feed single sheets while keeping sprocket paper in place. All this ImagePower is yours for just **$299.00***.



The new Star NX-1000 Rainbow

You can see six differences between the Star NX-1000 Rainbow and the NX-1000 Multi-Font: red, yellow, blue, green, orange and violet. The Rainbow prints in all these colors, plus black, to give you eye-catching reports, letters and charts.

The Rainbow has all the features of the Multi-Font, including four built-in fonts, excellent near-letter-quality text and graphics, and convenient paper handling functions.

But the Rainbow not only offers attractive print-outs, it even comes attractively priced at **$379.00***.

To see where you can find the Star NX-1000 Series, **call 1-800-447-4700.**

star micronics

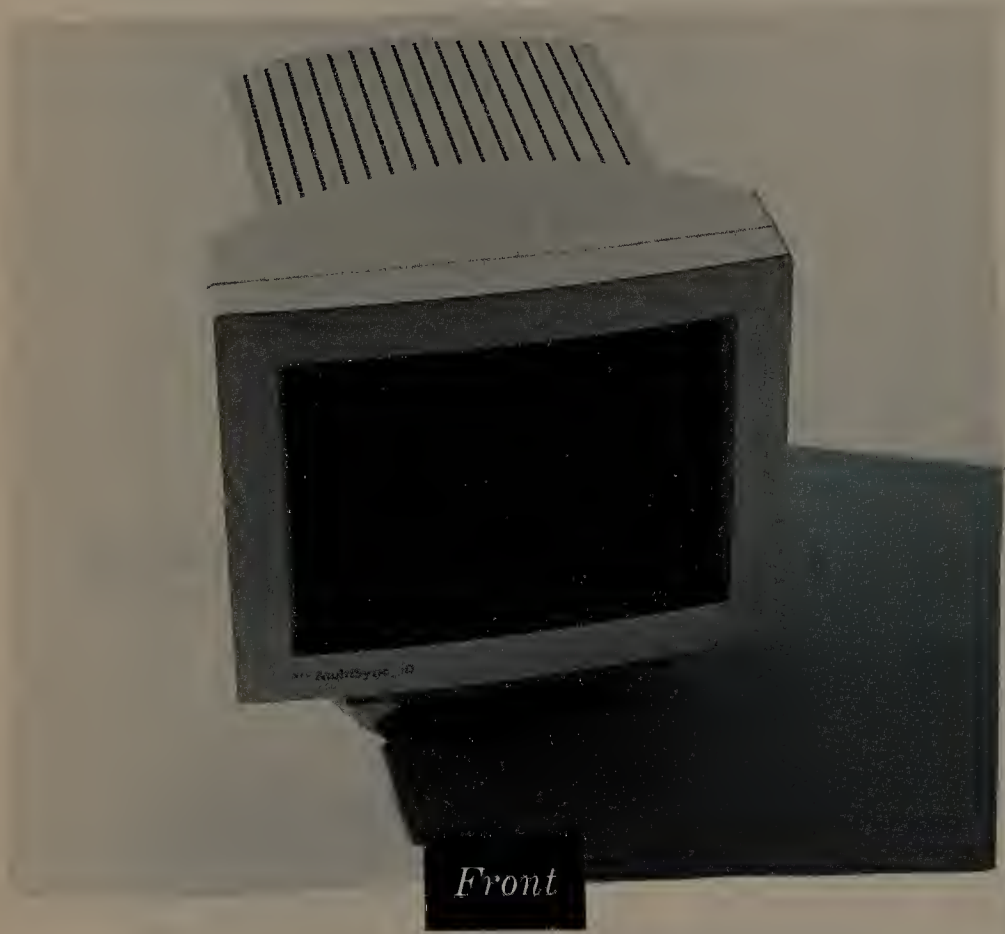
The ImagePower™ Printers

*Manufacturer's suggested retail price in U.S.

Circle 43 on reader service card

Some views on why the NEC MultiSync

There's a lot more to the new MultiSync® 3D monitor from NEC than meets the eye. Because instead of making one monitor for each graphics board, we've developed a monitor that enhances the performance of the modes on practically *any* board.



With its new microprocessor-controlled digital tuning system, MultiSync 3D can adjust to a given video standard with a precision matched only by a few high-end single-frequency monitors.

Making it perfectly compatible with virtually all systems and boards. From 8514A, SuperVGA and Mac II to VGA, EGA, MDA and

C&C
Computers and Communications

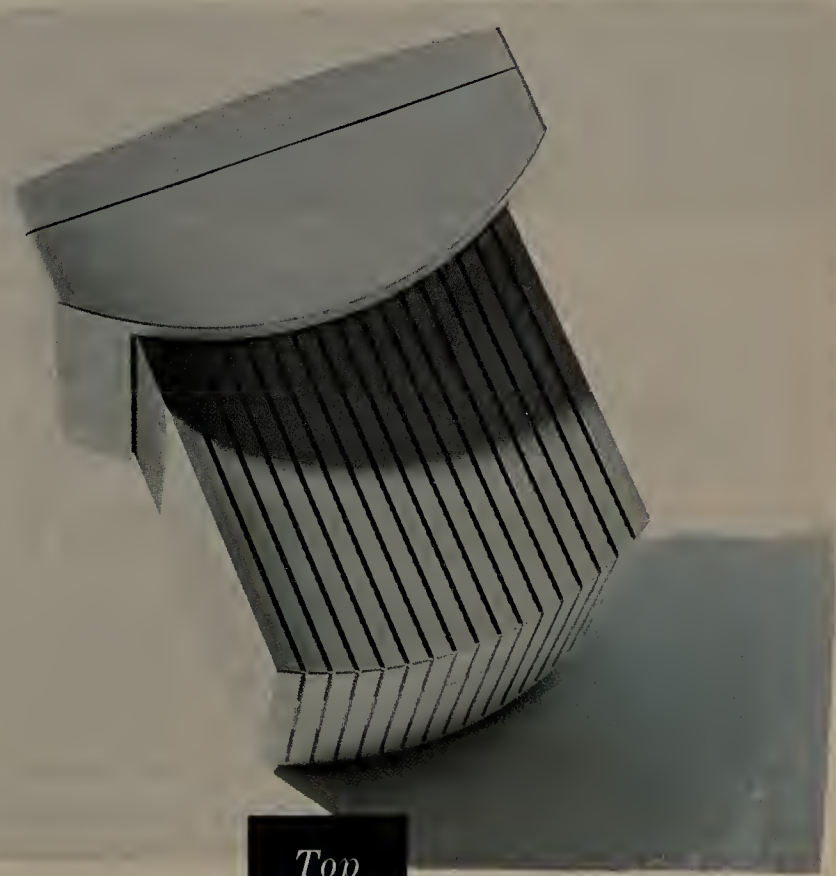
3D is the new monitor standard.

CGA. For an incredible maximum resolution of 1024 x 768.

What's more, MultiSync 3D is equally compatible with you and your workplace. There are upfront controls, for easier access. A 14″ non-glare screen on a tilt-swivel base, for more comfortable viewing. And, as you can see, there's even a full 360 degree design.

The way we see it, MultiSync 3D

Side



Top

has dramatically raised the standards by which all other color monitors will be judged.

MultiSync is a registered trademark of NEC Home Electronics (USA) Inc

For literature, call 1-800-826-2255. For technical details call NEC

Mac II is a registered trademark of Apple Computer, Inc

Home Electronics (USA) Inc. 1-800-FONE-NEC.

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NEC

Circle 171 on reader service card

to 39K with an optional IC memory card), and Epson LQ-2500 emulation. Graphics resolution is 180 by 360 dots per inch.

The Allegro takes in paper at the front of the machine and passes it straight through to the rear—instead of rolling it around the platen like other dot matrix printers. The printhead sits on top and strikes the paper as it passes underneath. This straight-ahead arrangement virtually eliminates paper jams and makes it easier to print thick forms and envelopes.

Functional design is prominent in the rest of the Allegro's features. At the end of a print job, pressing one button advances the fanfold paper so you can tear off the last sheet; another button rolls it back in for the next job. Paper parking requires only two button-presses. Fanfold paper stacks neatly between the printer's folding metal legs. Single sheets and envelopes can be fed in through a slot in the front of the machine.

The easy-to-use control panel is small but comprehensive. It lets you select fonts (including IC fonts), letter pitch, and proportional spacing; change default settings; and access additional character pitches and line spacings. No DIP switch setting is required.

As with most low-priced printers, the Allegro's output speed is far from dazzling. The Allegro takes 23 seconds to print a 250-word, double-spaced page in draft mode and a poky 48 seconds in NLQ mode. This compares rather poorly to the Epson LQ-850, which prints the same pages in just about half the time—13 and 28 seconds, respectively—but the Epson costs $350 more.

In addition, while the Allegro's print quality easily surpasses similarly priced 9-pin printers, it's positively uninspiring compared with many 24-pin machines. There are three resident NLQ fonts (Gothic, Tiempo, and Courier) and one draft font (Gothic). Draft text is readable, and the utilitarian Gothic and Courier typefaces are perfectly acceptable for interoffice needs and business correspondence. But the Tiempo font produced faded type with inconsistent inking. Alps sells an optional IC card with Prestige Elite, Orator, and OCR-A fonts, but the card uses the same slot as the 32K buffer upgrade.

Although the Allegro 24 is no speed demon and its output won't win any typographical beauty contests, it may be just the ticket for budget-conscious shoppers hungry for a decent, entry-level 24-pin printer. Thoughtful design, outstanding paper handling, and rock-bottom pricing make it a tasty value.
—*Wes Nihei*

WHERE TO BUY

Allegro 24
Alps America
3553 N. First St.
San Jose, CA 95134
408/432-6000
List price: $499
Accessories: font card $50, 32K memory card $99, single-bin sheet feeder $198, ribbons $11.95 each
Warranty: one year, parts and labor
Extended warranty: none
Technical support: toll-free number, M–F 8–5
Other support services: none
For more information, circle 685 on reader service card.

Eric Knorr is a senior editor for PC World. *Eric Grevstad is a New Hampshire–based computer journalist specializing in high-end portables and low-end software. John Diebold is a marine geophysicist specializing in computer analysis of seismic data. Alan Southerton is a freelance writer who is currently finishing a book on programming the OS/2 Presentation Manager. Wes Nihei is an assistant editor for* PC World. ●

POWER TIP NO. 31

Repeat Macros in WordPerfect

To execute a WordPerfect macro more than once, just position the cursor at the starting point, press <Esc>, enter the number of times you want the macro to repeat, and start the macro.

George Beinhorn
Nevada City, California

TI's OmniLaser 2106.
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When your success depends on making great-looking documents, you need a laser printer that's versatile enough to handle just about anything that comes up. That printer is Texas Instruments OmniLaser™ 2106.

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TI's OmniLaser 2106 with PostScript gives you excellent control over type, graphics and page composition.

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TI's OmniLaser 2106 gives you great graphics, text that looks typeset and paper handling features that allow you to print on envelopes, legal size and more. It also features multiple industry-standard emulations and interfaces. All easily selectable at the touch of a button.

TI's OmniLaser 2106. It's the laser printer of your future, as well as the one you need right away. The OmniLaser family also includes the 2108 small-cluster printer and the 2115 shared-resource printer. For a free brochure on how to choose a laser printer and information about TI's on-site warranty, call 1-800-527-3500.

TEXAS INSTRUMENTS

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NEW FROM **NSTL**
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How to Structure the Ideal MULTIUSER ACCOUNTING ENVIRONMENT.

An outstanding new tool helps simplify the transition.

The trend is clear. Today, business after business is upgrading from *single-user* to *multiuser* accounting systems.

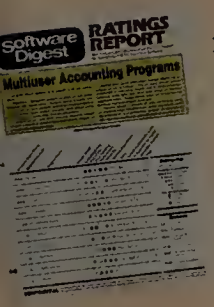
To maximize productivity and avoid costly delays, *several* departments and individuals need to share the same resources. This includes simultaneous access to critical financial data and the ability to run multiple functions concurrently.

The multiuser environment has become *essential!* Indeed, the sight of a lone bookkeeper tied to one terminal may soon be as archaic as the clerk with an eyeshade and quill pen hunched over a dusty ledger.

But the *right* product choices must be made—and *all* the elements must function together efficiently. *Three key elements are required:* a multiuser accounting software package, a compatible network operating system, and a powerful processor.

NSTL's *Selection Guide to the Multiuser Accounting Environment* can help you make the best decisions.

STAGE 1:
The right software.



In a multiuser environment, *network functioning* and *security features* are paramount. But *not* all programs take full advantage of the shared file capabilities of LANs. And security controls may be absent or deficient.

NSTL's *Selection Guide to the Multiuser Accounting Environment* gives you comparative ratings of the leading programs, including *AccPac Plus, Macola, Platinum, RealWorld, SBT Accounting Library, Solomon III* and others.

We tested each program for:

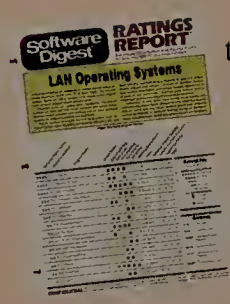
✓ **Audit Trail Performance.**
How strong is the integrity of the audit trail? Can you easily verify the numbers on financial statements? Will you waste time tracing business transactions? Can you find backup documentation?

✓ **Versatility and Report Generation.**
Are the program's features and capabilities sufficient to handle *all* your company's needs? Are there upgrade options so it can adapt as your organization grows? What reporting formats (predefined and customized) does the program permit?

✓ **Usability.**
How easy is the program to learn and use? To enter transactions and produce reports? How good is the user interface? What about menu navigation, help features, manuals, tutorials, other training aids?

✓ **Data Integrity and Security.**
How good are the controls for error handling and system failure? Are there automatic validity checks? How well does the program ensure against unauthorized access? Does it permit individual file and record locking?

STAGE 2:
The right network operating system.



LANs are so complex that they challenge even experts.

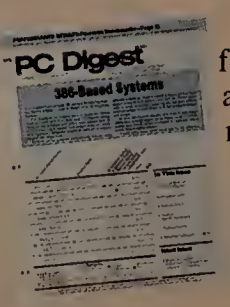
How many users will the network support? How quickly can transactions be processed? What topologies and network adapters are supported?

Some multiuser accounting programs will *not* work efficiently on certain networks. What's more, installation and maintenance can prove difficult and frustrating.

We've cut through the confusion and simplified the decision—with detailed tests and comparative ratings of the network operating systems of *IBM, Novell, 3Com* and others.

The *Guide* supplies the results of our exhaustive LAN functionality tests for data protection, administrator utilities, file servers, printer operations and much more.

STAGE 3:
The right processor.



To optimize the performance of multiuser accounting software, you need a powerful processor as your file server. A *386-based* file server is ideal.

NSTL has run comprehensive tests on the latest 386 models manufactured by *ALR, Compaq, Everex, IBM* and others.

Our data will help you select the right file server—one powerful enough to fully support your new multiuser accounting system.

Solid recommendations simplify a challenging task.

On the basis of its tests, NSTL has reached firm conclusions on which components are *best*—and *why*.

Our superb graphics and "star" rating system let you see *at a glance* which products are right for your organization's needs. All specifications and prices are included.

So you won't have to guess. You'll *know* which system is best. You'll have the hard data you need to make a sound, defensible decision. And you'll *avoid* mistakes that can cause big trouble.

NSTL's *Selection Guide to the Multiuser Accounting Environment* consists of three current, detailed reports in a handsome, durable three-ring binder. The price is just $95. Your satisfaction is guaranteed.

Remember: for the multiuser accounting environment to work, *every* element must be right. The stakes are high. A small investment you make today can protect a much larger one. Order this valuable guide now.

For fastest service, CALL TOLL-FREE:
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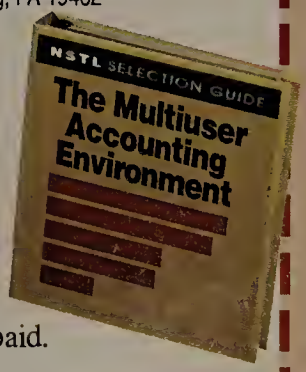

❑ **YES** — send us NSTL's *Selection Guide to the Multiuser Accounting Environment* for $95, plus shipping and handling. If we're dissatisfied for any reason, we may return it without being charged, or receive a full refund if prepaid.

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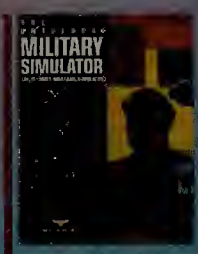

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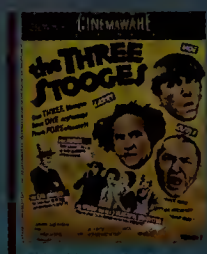

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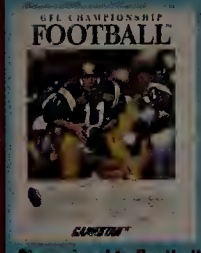

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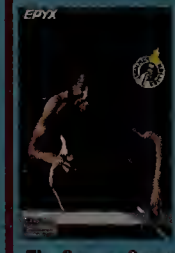

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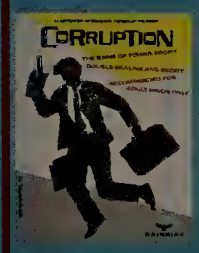

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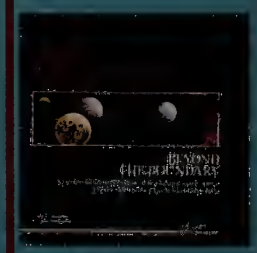

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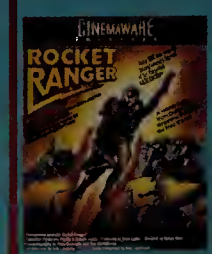

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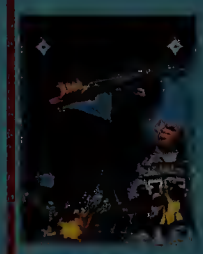

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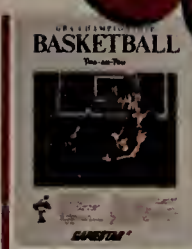

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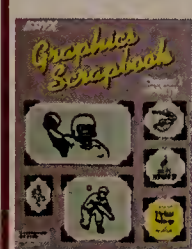

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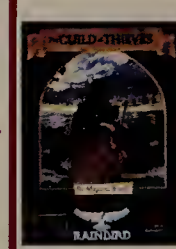

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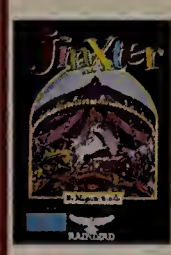

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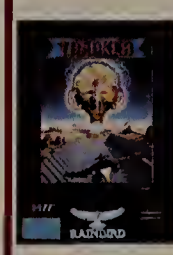

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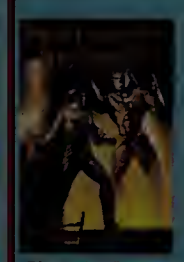

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134 **Professional File 2.0**
Software Publishing upgrades its star flat-file data base manager, improving data entry and adding the ability to read *dBASE* files directly.

138 **1-2-3 Small Business Kit**
Painless entrée into *1-2-3* for small-business owners. Along with the Lotus spreadsheet, you get nine easy templates and a year's worth of hand-holding.

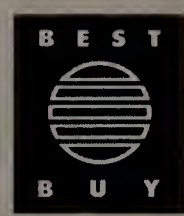
140 **Publish-It 1.12**
Create newsletters and other short documents with this low-cost desktop publisher that offers the page design and style sheet talents of high-end packages.

148 **PackRat 1.0**
Windows users will welcome this personal information manager's ability to pop up over other windows to display a phone number or an expense item. Just be prepared to take the time to master it.

152 **Remote 2 1.01**
DCA/Crosstalk's versatile long-distance–access program is a snap to learn and simple to run—once you log on to a remote PC, but therein lie the bugs.

Professional File 2.0

Flat-file data base manager



PROS: Reads dBASE data directly, improved data entry, application generator, quick and easy to use

CONS: Limited report formatting, unimpressive speed

With *Professional File 2.0*, Software Publishing hopes to challenge the king of the flat-file mountain, Symantec's *Q&A 3.0* (see *PCW*, July 1988). Version 2.0 may not depose its more costly rival, but it's a marked improvement over version 1.01 (which won our Best Buy ribbon in "Five Flat-File Favorites," *PCW*, August 1988).

In version 2.0 *Professional File* gains some file-linking capabilities, a simple application generator, and the ability to read *dBASE* files without conversion. Software Publishing has greatly improved the program's data entry and validation and boosted file size by a hefty margin. The price, however, has risen to $299, and the program's appetite for RAM has grown from a modest 256K to 512K. And while it performs well enough, *Professional File 2.0* isn't always faster than its predecessor.

In upgrading *Professional File*, Software Publishing focused on data entry and validation. Where version 1.01 couldn't restrict entries to a predetermined range, date, or time, *Professional File 2.0* supports date and time fields. Moreover, the program can now use lookup tables to validate data, and it checks for valid data ranges and duplicate indexes; automatic troubleshooting detects errors in formulas as they are entered. As with the earlier version, however, you still can't require an entry in a field.

Though *Professional File 2.0* won't swallow the huge files *Q&A* relishes, maximum file size has risen from 29,500 records to 59,000, and from 4MB to 8MB. By contrast, *Q&A* allows 16 million records or 256MB of data.

ANDREW SHACHAT

Edited by
William Rodarmor

FEATURES EVALUATION

Professional File 2.0: Notable Improvements

With version 2.0, Software Publishing has substantially improved Professional File's data entry and editing capabilities.

● Yes
○ No
◒ Deficient

Data entry, editing, and validation	Professional File 2.0	Professional File 1.01	RapidFile 1.2	Q&A 3.0
Variable-length fields	●	●	●	●
Currency fields	●	●	○	●
Calculated fields	●	●	●	●
Date/time fields	●	○	◒[1]	●
User-customized screens	●	●	●	●
Global record update/deletion	●	●	●	●
Validates via lookup table	●	○	○	●
Checks for valid data range	●	○	●	●
Checks for duplicate index keys	●	○	○	●
Requires entry on all fields	○	○	○	●
Number of data entry screens allowed	32	32	10[2]	10
Search and sort parameters				
Searches/sorts on nonindexed fields	●	●	●	●
Searches/sorts on multiple fields	●	●	●	●
Searches/sorts macros	●	●	●	●
Wild-card/substring searches	●	●	●	●
Case-sensitive searches	○	○	○	○
Boolean/compound-Boolean searches	●	●	●	●

Reporting capability	Professional File 2.0	Professional File 1.01	RapidFile 1.2	Q&A 3.0
Saves report formats	●	●	●	●
Sends reports to screen or disk	●	●	●	●
Date stamping	●	●	●	●
Mailing label formats	●	●	●	●
Headers/footers	●	●	●	●
Forced page breaks	●	●	●	●
User-defined formats	●	●	●	●
Default formats	●	○	●	○
Capacity				
RAM requirements	512K	256K	256K	512K
Maximum file size	8MB	4MB	10MB	256MB
Maximum records per file	59,000	29,500	64,000	16 million
Maximum fields per record	3200	3200	254	2182
Maximum record size	56.3K	53.7K	7.5K	16.7K
Maximum text-field size	2K[3]	2K[3]	64K	1.67K
Reads/writes DIF	○	○	○	●
Reads/writes ASCII	●	●	●	●

[1] Date fields only.
[2] 250 lines total.
[3] Maximum size is actually one screen.

As before, *Professional File 2.0* supports free-form data base design and lets you alter a form without losing data. The mechanics of entering data are very easy and largely unchanged from version 1.01. Data now can be shared between files by a simple expedient: You copy a field name from one form to another, and the data goes along. And *Professional File 2.0* lets you alter a field's length after form design and data entry.

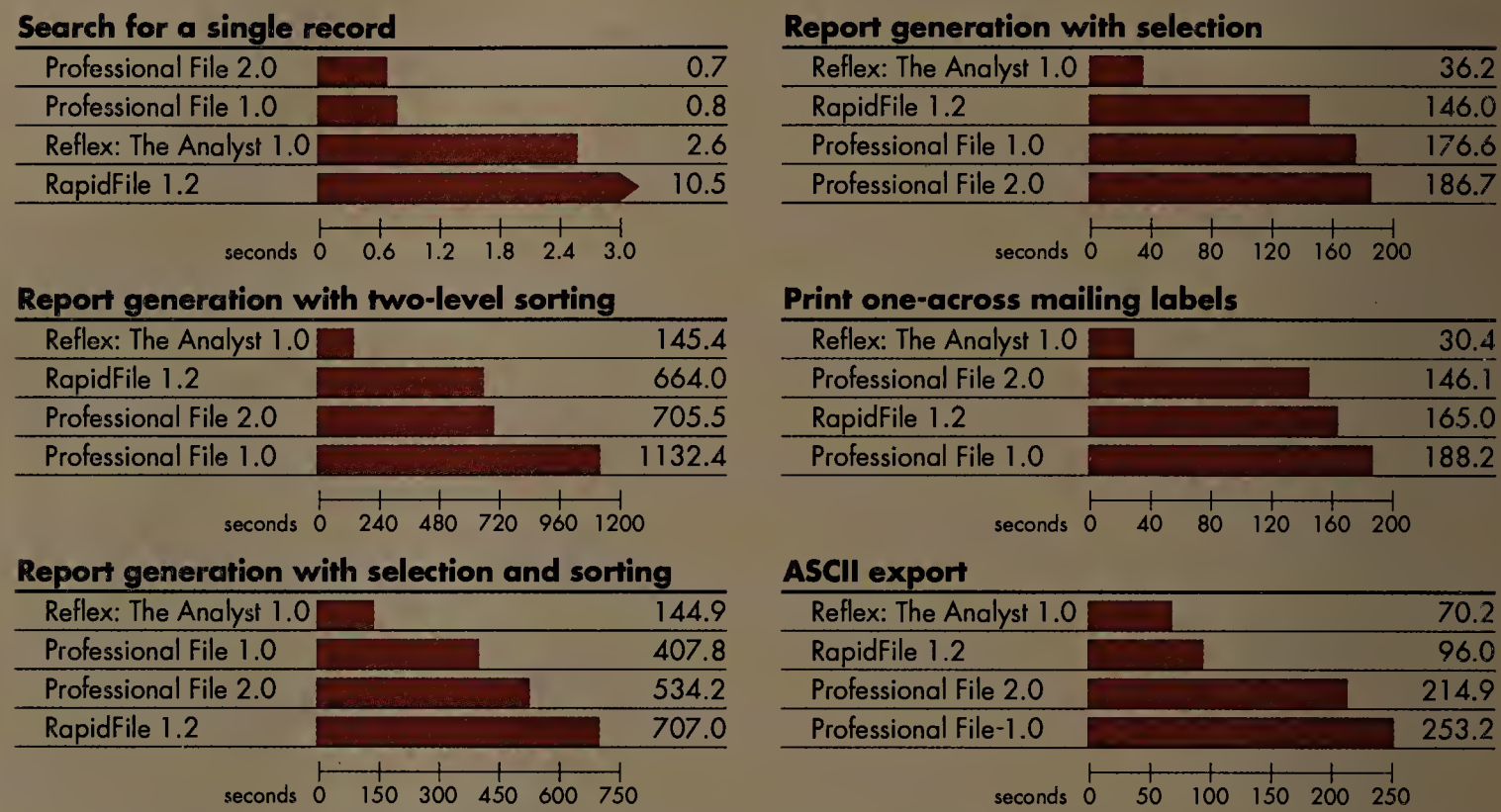
While still essentially a flat-file manager, *Professional File 2.0* lets you look up values from separate files, as well as from other records in the same file. You can also look up values directly from *dBASE* files without importing them, which is very useful in offices that use *dBASE* for more sophisticated applications. You can look for exact matches in lookup values and for >= or <= matches as well.

Reporting is as quick and easy as ever. Reports can include headers, footers, page numbers, and even column titles. The program's new tabular data-formatting capabil-

NSTL TEST REPORT

Professional File 2.0: Middling Speed

Version 2.0 of the popular flat-file manager runs in the middle of the pack and isn't always faster than 1.0.



All benchmorks were performed on on 8-MHz IBM PC AT with 640K of RAM ond o 30MB hord disk, except Reflex, which required 2MB of RAM. Testing wos timed from the lost keystroke of the commond sequence until control wos returned to the user.

Search for a single record
This test meosures the time required to seorch for o single record in o 5000-record inventory file, using the fostest type of seorch the progrom ollowed.

Report generation with two-level sarting
This test meosures the time required to sort the inventory file using the price field os the primory key ond the port number field os the secondory key, ond to print the report consisting of 4 fields to o null printer (o device thot simulotes on infinitely fost printer, one not slowed by poper or printheod movement).

Report generation with selection and sorting
This test meosures the time required to sort the inventory file on the price field, select 818 records with price > 150, ond print the report consisting of 10 fields to o null printer.

Report generatian with selection
This test meosures the time required to sort the inventory file on the price field, select 526 records with price > 5105.00 ond port # > 104000, ond print the report consisting of 10 fields to o null printer.

Print ane-across mailing labels
This test meosures the time required to print to o null printer moiling labels consisting of 3 fields. The fields were token from 1000 records that were ordered by port number.

ASCII expart
This test meosures the time required to select 1000 records from o 5000-record doto bose ond export them into o stondord ASCII text file.

Data based an tests designed and conducted by National Software Testing Laboratories (NSTL). All rights reserved.

ity allows data to be displayed in spreadsheet format. And version 2.0 will print data in any position on a page, enabling you to use preprinted forms.

Also new in *Professional File 2.0* is a handy interactive application generator called AutoPilot. AutoPilot lets you create menus and arrange a sequence of functions and actions to automate routine tasks and facilitate data entry. Applications can be modified during or after creation. One catch is that an application can be distributed only to other *Professional File 2.0* users, as the complete program is necessary to run it. At press time, Software Publishing was shipping a new five-user network version, which also requires purchase of the basic program.

Professional File 2.0's features are considerably more impressive than those of Ashton-

How we made the most powerful integrated software a whole lot easier to use.

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Plus, the Symphony spreadsheet is the fastest and most powerful spreadsheet available in integrated software, based on Lotus® 1-2-3®, the industry-standard spreadsheet technology.

We could go on about the many features of Symphony 2.0—how its macros let you automate complex or repetitive tasks and create customized applications. How the word processor now has a spelling checker and text outliner. And how database and communications have been improved.

The bottom line is that Symphony is one high performance package that's made to be opened up.

Lotus Symphony 2.0

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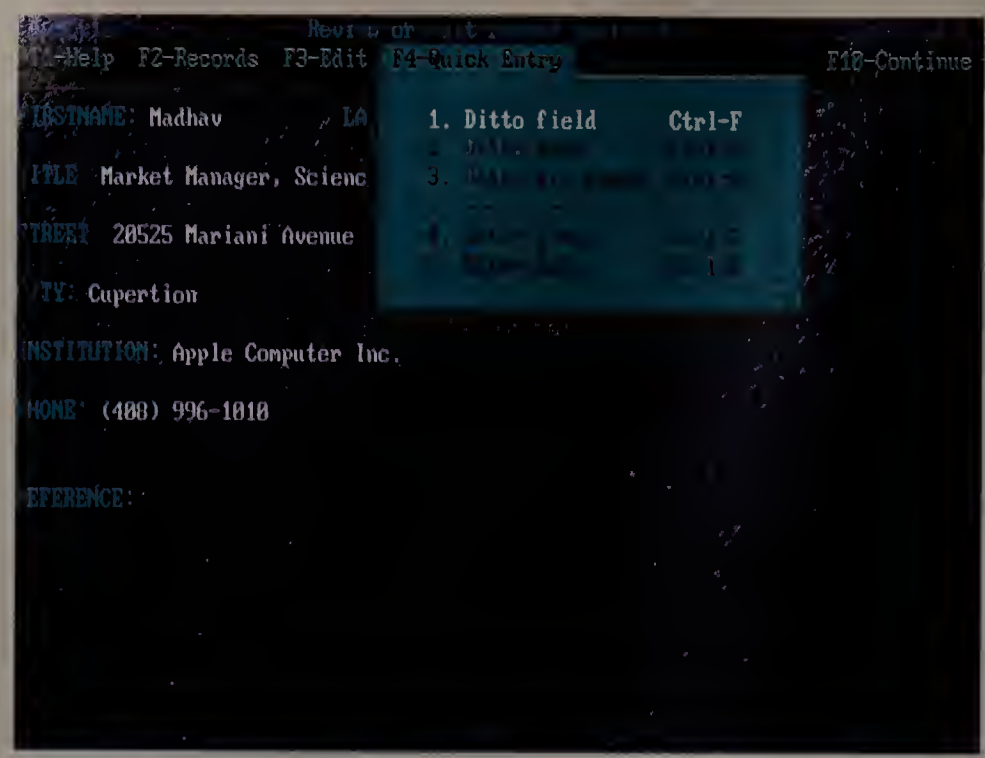

Professional File's handy ditto feature saves data entry time by quickly copying information between records.

Tate's *RapidFile* and Borland's *Reflex* (though it trails the latter in speed). *Q&A* is slightly more powerful and handles much bigger files but is otherwise comparable. Overall, *Professional File 2.0* is best at small-scale data handling, but its ability to access *dBASE III* and *1-2-3* files makes it a useful addition to offices using high-end data bases and spreadsheets. —*Diana Gabaldon*

WHERE TO BUY

Professional File 2.0
Software Publishing Corp.
1901 Landings Dr.
P.O. Box 7210
Mountain View, CA 94039-7210
415/335-2320, 415/962-0191 (technical support)
List price: $299, upgrade $75 (includes 30-day money-back guarantee); five-user LAN Pack $499 in addition to the basic program
Requirements: 512K, hard disk, DOS 2.0 or later version
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Other support services: 90-day disk warranty, quarterly newsletter free to registered users
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1-2-3 Small Business Kit

Spreadsheet and utility package

BEST BUY

PROS: Inexpensive worksheet solution for small-business owners, easy-to-use models, valuable phone support

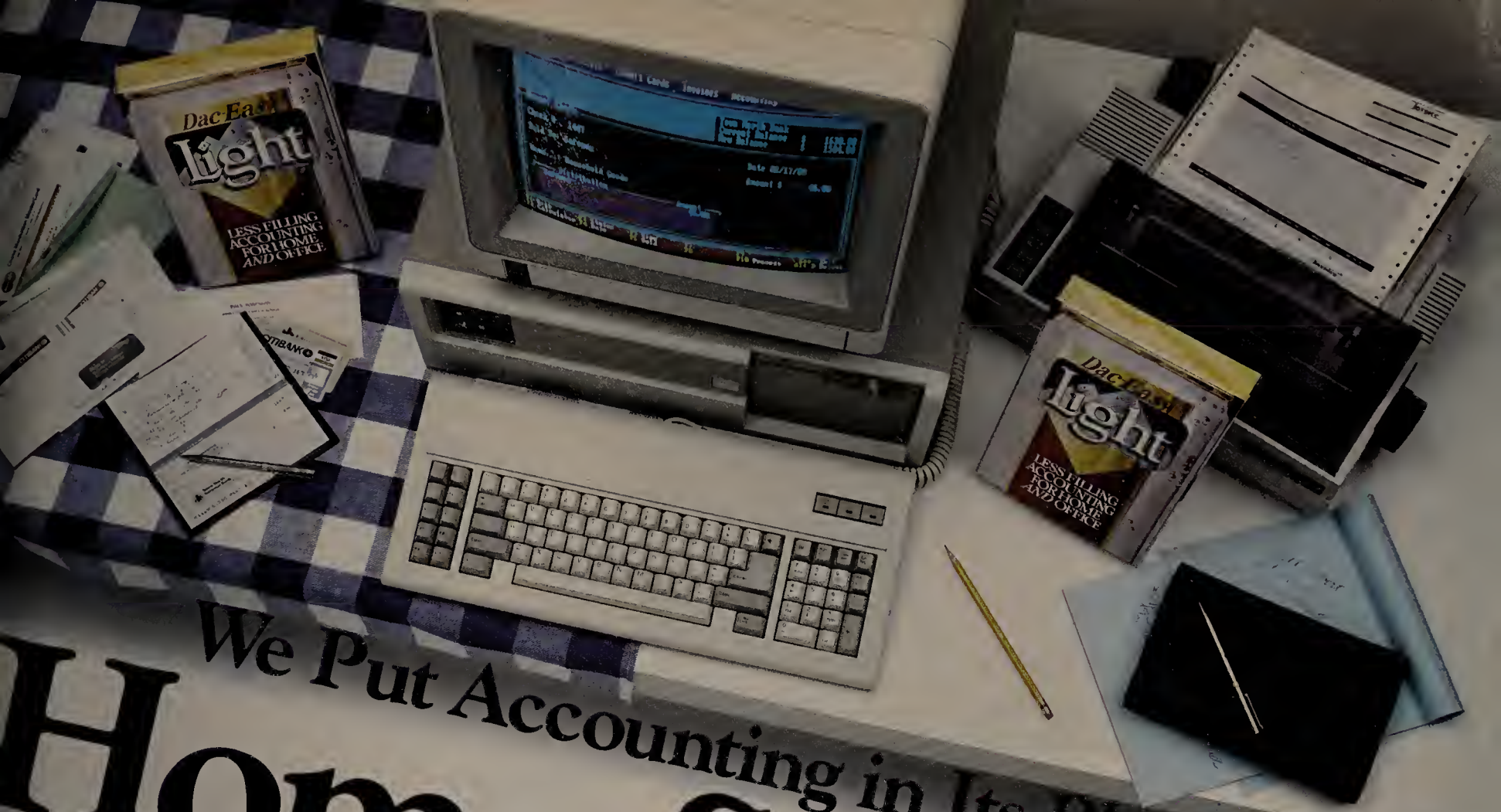
CONS: Models aren't integrated, lacks macros

For small-business owners who need help mastering spreadsheets and financial models, Lotus's *1-2-3 Small Business Kit* is like a pair of training wheels with a year-long warranty. Costing just $100 more than *1-2-3* alone, the kit packs a copy of *1-2-3* release 2.1, nine financial templates, and a year of technical support from Lotus. The templates are fairly basic and lack both integration and macros, but 12 months of advice makes the package nearly irresistible.

The *1-2-3 Small Business Kit* provides a good selection of basic worksheet models that give an overview of a company's financial health, as well as a few pointers on financial planning. You get an income statement and balance sheet, a cash-flow analysis, a cost/volume/profit analysis, a cash budget, and forecasted financial statements. To help the worksheets survive rookie tinkering, formulas are protected, and assumptions are grouped in an input table to ease data entry and further protect the formulas.

The models come ready to run right out of the box; you can customize them later, once you've mastered a few *1-2-3* techniques. Each template's input and output tables make it easy for novices to update the figures. If you're eager to see the fruits of your labors, the models contain some predefined ranges that allow you to print the results without having to specify a range and to create a graph without having to define the settings. You need only invoke the Print command; once the data is entered, graphs are as close as the <F10> (Graph) key.

While adequate, the kit's models suffer from two drawbacks. First, they aren't integrated; even a business's basic data must be entered separately in each model. By contrast, *Venture*, a new business planner from Star Software of Torrance, California, can



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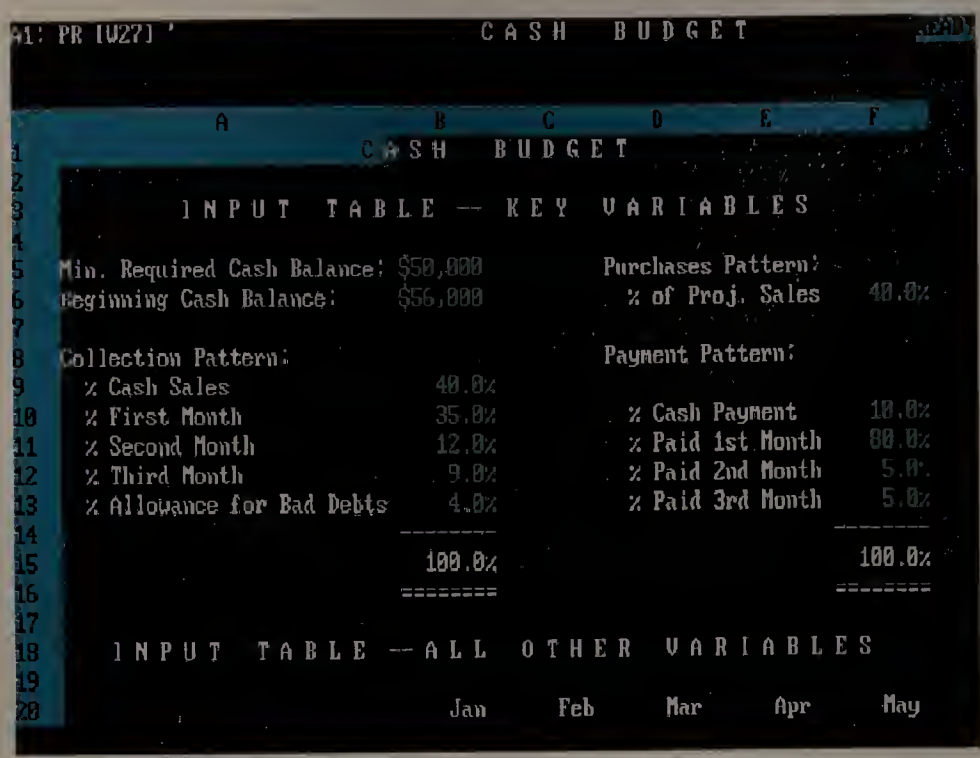

The 1-2-3 Small Business Kit's simple formulas give owners an overview of their businesses. This model displays asset composition from the prior year.

share common data across templates. Second, the Small Business Kit doesn't use macros. Again, this contrasts with the slick, expensive templates sold by Seattle's Management Advisory Services. Nonetheless, the models are a great buy for the price. At press time, Lotus was planning to release the kit's financial modules in a standalone package, *Lotus 1-2-3 Business Applications.*

Probably the kit's greatest value lies in the hand-holding it offers. The documentation will help hesitant users get their feet wet. It also provides information on the Small Business Administration, other *1-2-3* templates and add-ins, financial terms, and DOS basics. Adding a few chapters on financial planning would be a good idea, since many small-business owners may not have generated income statements, balance sheets, and other financial documents.

Finally, kit users should find Lotus's free telephone support invaluable. Unlike their corporate counterparts, most small-business operators have no place to turn with questions. It's comforting to know that a team of experts is available 12 hours a day to unravel knots with *1-2-3* and common business problems. Although the addition of a few features would improve this kit, it is one of the best investments a small-business owner can make. —*Mary V. Campbell*

WHERE TO BUY

Lotus 1-2-3 Small Business Kit
Lotus Development Corp.
55 Cambridge Pkwy.
Cambridge, MA 02142
617/577-8500
List price: $595
Requirements: 256K, two disk drives, DOS 2.0 or later version
Technical support: 12 months free, toll-free number, M–F 8–8
Other support: CompuServe forum (Go LotusB)
For more information, circle 671 on reader service card.

Publish-It 1.12

Desktop publishing program

PROS: Low price, on-line help, good printer support, style sheets, imports formatted text, includes paint/draw tools

CONS: Lacks automatic text flow, orphan and widow control, automatic column balancing, and vertical rule insertion between columns

Timeworks' *Publish-It* is a high-quality, low-cost desktop publishing program for producing newsletters and other short documents. The *GEM*-based program offers excellent text editing, paint, and draw tools; has good text and graphics import skills; allows manual kerning; and uses dictionary hyphenation.

Though basically a page layout program like Aldus's *PageMaker, Publish-It* looks a lot like Xerox's *Ventura Publisher.* The program delivers decent page design yet also uses style sheets, which are useful in laying out long documents—and are missing from *Publish-It*'s main rival, Software Publishing's *PFS: First Publisher* (see *The Software Shelf, PCW,* November 1988). Version 1.12 of *Publish-It* can't automatically flow text from page to page, but a forthcoming upgrade should remedy this and other shortcomings.

Although it borrows *PageMaker*'s master page concept, *Publish-It* relies on *Ventura*-type frames. To place text in *Publish-It,* you draw a frame, then import text created in your word processor. *Publish-It* retains character attributes—boldface, underlining, subscripts, and superscripts—when the document is imported.

(continues)

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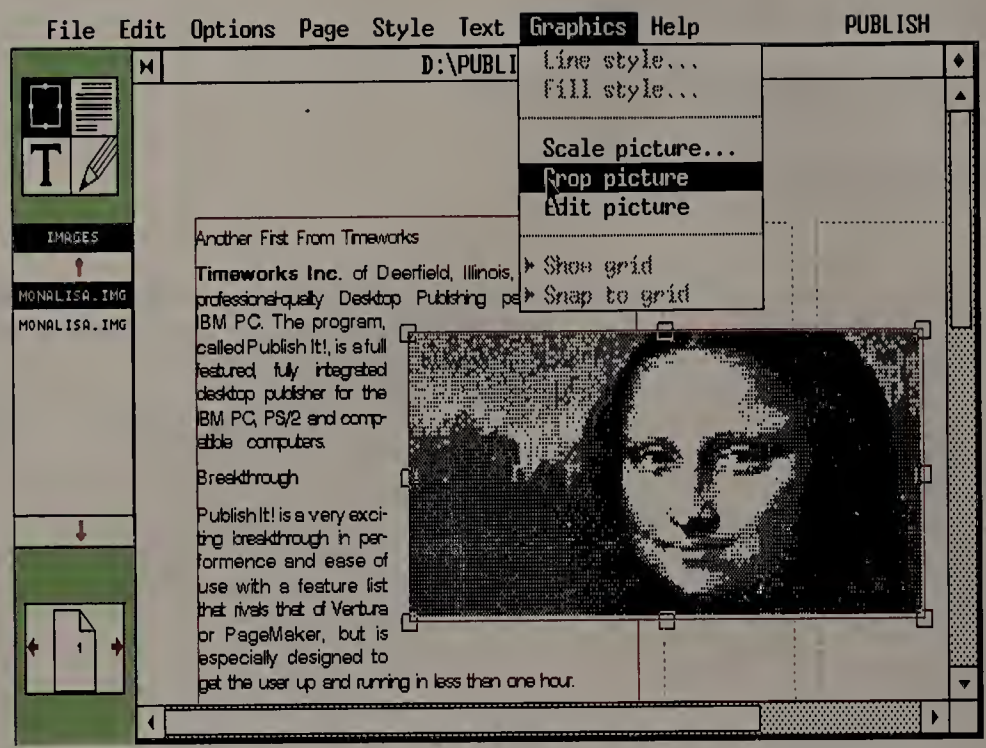

Thanks to Publish-It's handy text manipulation tools, importing text from word processors is simple.

The ingenious way *Publish-It* uses style sheets is so simple, it's almost childish. You create paragraph tags in your word processor, then import the text with the tags attached. For example, you type <headline> before paragraphs that are headline text; when *Publish-It* imports the paragraphs, it automatically assigns them the appropriate attributes. If you later change a style, all tagged paragraphs globally change to the new setting. Theoretically, *Publish-It* handles documents as long as 999 pages, far exceeding *PageMaker*'s and *First Publisher*'s limits of 128 and 99 pages, respectively. But until Timeworks adds automatic text flow, working with documents longer than about 25 pages will drive you crazy.

Still, a logical combination of mouse moves and keystrokes makes for fast work. For example, *Publish-It* lets you quickly search and replace, or reduce multiple spaces to just one. The program also offers copyright, registered trademark, and many foreign language symbols.

Publish-It imports graphics in *GEM*, .PIC, .PCX, and .IMG formats and text from *WordPerfect 4.2*, *Microsoft Word 4.0*, and *WordStar 4.0*. Finally, *Publish-It* provides freehand drawing complete with 36 different fill patterns, circles, ovals, and even polygons. Placing graphics is easy, and cropping them is far simpler than with *Ventura*.

Publish-It supports serial and bus mice and a solid array of printers: Epson 9-pin and 24-pin dot matrix printers and compatibles, Printer Command Language printers such as the HP LaserJet Series II, and PostScript laser printers.

Version 1.12 of *Publish-It* supports only standard paper sizes, so if you plan a 7-by-9-inch brochure, *Publish-It* can't size the paper or insert crop marks. In addition, it lacks adjustable line thickness, widow and orphan controls, and automatic column balancing. By the time you read this, however, Timeworks should have released an upgrade that includes automatic text flow, supports pages to 17 by 22 inches, and adds file importing for DCA, *WordPerfect 5.0*, *Microsoft Word 5.0*, *Framework*, and TIF formats. If the upgrade delivers on its promises, buy it!
—*George Sheldon*

WHERE TO BUY

Publish-It 1.12
Timeworks, Inc.
444 Lake Cook Rd.
Deerfield, IL 60015
312/948-9200
List price: $199
Requirements: 512K (640K recommended), two disk drives, DOS 3.0 or later version, graphics adapter (mouse recommended)
Not copy protected
Technical support: unlimited, no toll-free number, M–F 8:30–5
Other support services: none
For more information, circle 672 on reader service card.

PackRat 1.0

Windows-based personal information manager

PROS: Handy for logging phone calls and expense items, useful as a daily planner

CONS: Awkward data entry, too many separate data bases, no browse feature

If you're a *Windows* user looking for a personal information manager, *PackRat* from Polaris Software is one of the very few products that meets your needs. *PackRat* is kin to such products as Valor Software's *Info-XL*

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Stone, Federal Computer

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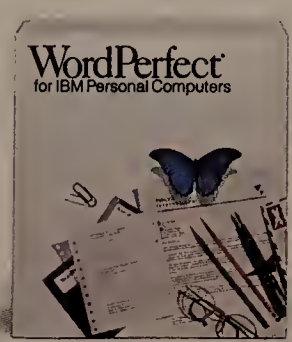

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PackRat's Agenda facility includes a handy alarm clock feature. As with the program's other facilities, records can be supplemented with up to 32K of notes, displayed in the window behind the entry.

and Lotus's *Agenda*, but since *PackRat* is a *Windows* application, it can pop up over other *Windows* programs when you need a phone number or an expense account item. But *PackRat* is a multimodule program that's finicky about how and where information can be entered. It will appeal mainly to people ready to invest the time required to learn it. Others will find that while the idea is attractive, the program itself is too complicated to bother with.

PackRat consists of nine "facilities": Calendar/Date List, Phone Book, Phone Log, Task List, Agenda, Expense Log, Index Cards, Disk Log, and Global List.

The Calendar/Date List is this rat pack's undisputed leader: The calendar permanently occupies the upper left corner of *PackRat*'s window, and the Date List loads automatically into the bottom half. As you scroll through the calendar, summaries of any dated items that have been entered into the other facilities appear in the Date List window. Selecting an item calls up a window with the full display of information attached.

The eight other facilities are stacked in the upper right corner. Selecting another facility bumps the Date List into the stack and substitutes the chosen facility.

Opening any facility requires a search, without keywords if you want the whole list. An open search of the Phone Book, for example, produces a listing of all names and phone numbers that have been entered. Choose a single entry, and a window pops up with the full item display: name, company, position, address, two user-defined keyword fields, and of course phone numbers.

The Phone Log integrates neatly with the Phone Book. Use its auto-dial feature to make a call, and a notepad automatically pops up in the bottom half of the screen. Depending upon available RAM, you can enter up to 32K of text. It's a nifty way to keep dated records of phone calls.

PackRat also offers a feature that lets you search all or a group of facilities, and a Disk File facility for logging information about any program or data file on your disk.

The main problem with *PackRat*—as its name would suggest—is clutter. There are simply too many separate facilities. Since the Agenda, Task List, and Expense Log all use the same structure for items—summary line, up to five keywords, a purge date, and the ability to attach a note of up to 32K—Polaris would have done well to simplify things by combining the three into a single facility.

Moreover, the program's lack of a browse feature really limits it. The Index Card facility, a cramped flat-file data base, suffers the most. To view each item, you must return to the summary screen and select it, a time-consuming process to say the least. Finally, *PackRat* provides a utility for importing and exporting data, but the process—especially for importing—is so complicated, you'd turn to it only as a last resort.

Polaris clearly has some work ahead to train its *PackRat* properly and at press time was planning a network version. But until other products arrive, *Windows* users in the market for a phone log and daily planner should take a close look. —*Patrick Marshall*

WHERE TO BUY

PackRat 1.0
Polaris Software
613 W. Valley Pkwy. #323
Escondido, CA 92025
619/743-7800
List price: $395
Requirements: Windows 2.03 or later version (run-time version included), DOS 3.0 or later version

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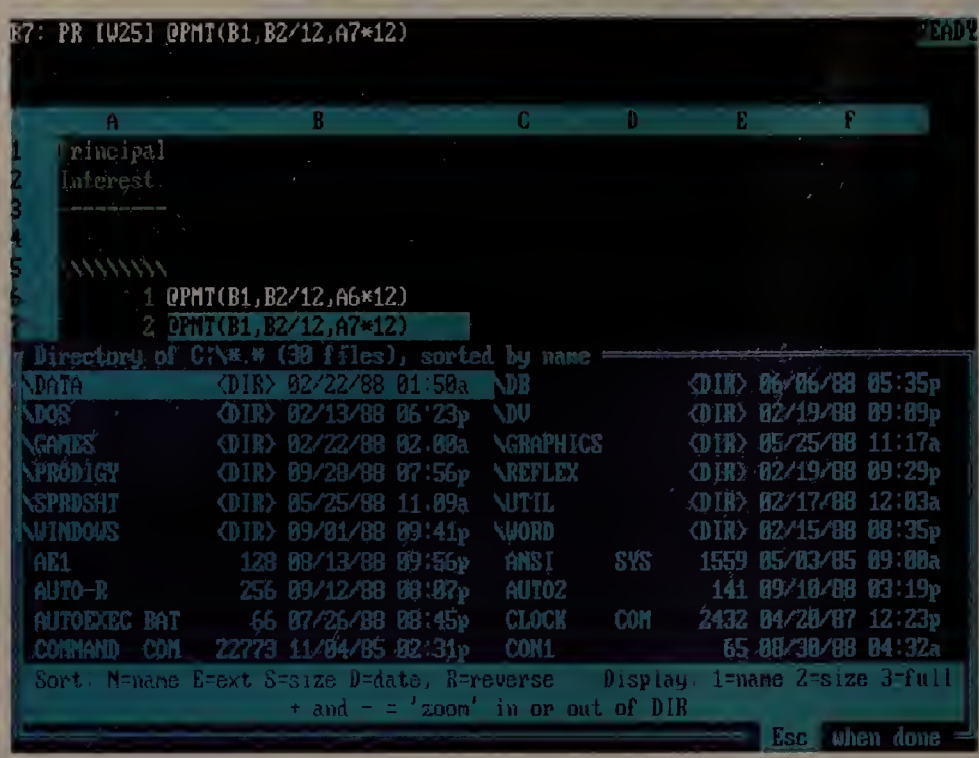

Remote2 lets you zoom in and out of subdirectories and drives on your own PC while working on a remote one. Here a local directory listing overlays the worksheet running on the remote PC.

Not copy protected
Technical support: unlimited, no toll-free number, M–F 8–5
Other support services: none
For more information, circle 673 on reader service card.

Remote2 1.01

Remote communications software

PROS: Easy to use, good documentation, host module accepts calls from communications software other than Remote2

CONS: Buggy; doesn't support EGA, VGA, or Hercules graphics

With *Remote2 1.01*, DCA/Crosstalk Communications adds another long-distance–access program to a list that includes Norton-Lambert's *Close-Up* and Meridian Technology's *Carbon Copy Plus* (see "Remote Assistance," *PCW*, October 1988). *Remote2* is quick to set up and a breeze to learn; once you're logged on to a remote PC, it's simple to run applications, troubleshoot, or pick up and drop off files. But despite the program's two-year gestation period, *Remote2*'s log-ons and file transfers are as glitchy as a first-time product's.

Like all remote packages, *Remote2* comes in two parts. You install a memory-resident host module—*Remote2 Host*—on the PC that callers will be logging on to. You use a second module, *Remote2 Call*, at the other end. However, *Remote2* is the only package of this kind that also lets you call a host PC and run its applications with such standard programs as Datastorm's *ProComm* or DCA/Crosstalk's own *Crosstalk XVI*.

Setting up a PC to serve as a *Remote2* host is straightforward enough. You load the call manager program and assign caller names and log-on passwords. Except for passwords, security is limited to having *Remote2* hang up and call back after a caller logs on. You can't restrict callers' access to certain files or directories on your system or limit their file-transfer rights—though of course you could disable the program's file-transfer modules entirely. Once the host call manager is configured, you load a 52K memory-resident kernel that answers the phone, accepts passwords, and negotiates communications links.

If you're the one dialing in to a *Remote2* host system, you load the 98K *Remote2 Call* module and instruct it to place the call. With luck, the program will automatically log on to the remote PC and display its current screen. There you can run applications and perform DOS-prompt machinations with nary a restriction. Via a pop-up menu, you can take screen snapshots, disable the host's keyboard, redirect output from the host's printer to the caller's printer, or skip back out to DOS on your own PC. The caller can initiate background file transfers even while the user of the host PC is rattling away in an application. A pop-up chat screen permits on-line conversation between the caller and the host. Both PCs keep rudimentary logs of communication sessions but don't record activities performed on the remote PC.

Unlike with *Close-Up*, however, the *Remote2* host PC can't reverse the arrangement and call the distant PC. Nor does *Remote2* let you switch between voice and data. And unlike *Carbon Copy Plus*, *Remote2* supports only character-based displays and CGA graphics. Attempting to run software in

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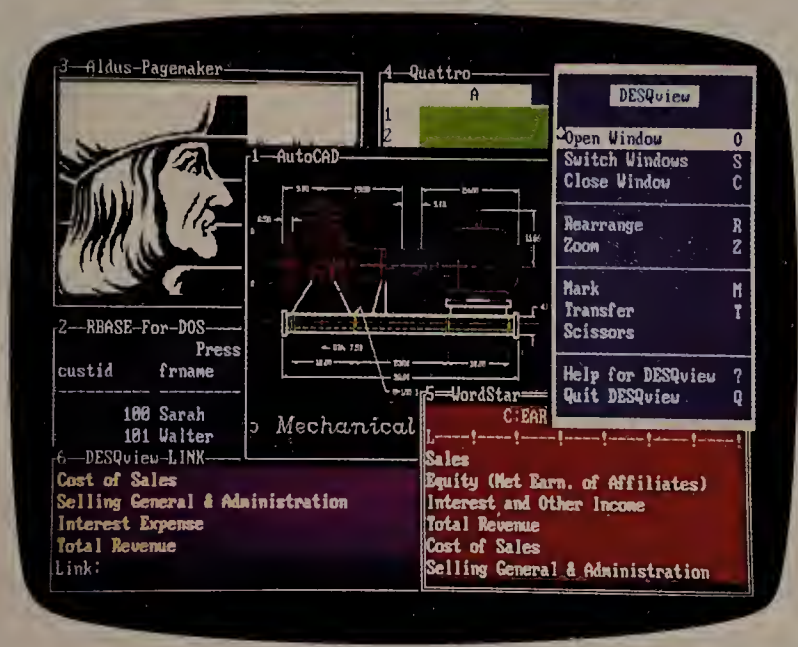
For those who have trouble remembering DOS commands, it adds menus to DOS. It even lets you sort your files and mark specific files to be copied, backed-up, or deleted—all without having to leave the program you're in.

Best of all, DESQview accomplishes all this with a substantial speed advantage over any alternative environment.



Multitask beyond 640K.

When you want to use several programs together, you don't have to leave your current program. Just open the next program. View your programs in windows or full screen. Open more programs than you have memory for. And multitask them. In 640K. Or if you own a special EMS 4.0 or EEMS memory board, or a 386 PC, DESQview lets you break through the DOS 640K barrier for multitasking. You can start 1-2-3 calculating and tell Paradox to print mailing labels while you're writing a report in Word Perfect, or laying out a newsletter in Ventura Publisher, or designing a building in AutoCAD.

For programmers, DESQview's API, with its strengths in inter-task communications and multitasking, brings a quick and easy way to adapt to the future. With the API's mailboxes and shared programs, programmers are able to design programs running on DOS with capabilities like those of OS/2.

DESQview even lets you transfer text, numbers, and fields of information between programs.

Fulfill the 386 promise.

For 80836 PC users, DESQview becomes a 386 control program when used in conjunction with Quarterdeck's Expanded Memory Manager (QEMM)-386—giving faster multitasking as well as virtual windowing support.

And when you use DESQview on an IBM PS/2™ Model 50 or 60 with QEMM-50/60 and the IBM Memory Expansion Option, DESQview gives you multitasking beyond 640K.

Experts are voting for DESQview. And over a million users, too.

If all of this sounds like promises you've been hearing for future systems, then you can understand why over a million users have chosen DESQview. And why *PC Magazine* gave DESQview its Editor's Choice Award for "The Best Alternative to OS/2," why readers of *InfoWorld* twice voted DESQview "Product of the Year" why, by popular vote at Comdex Fall for the last two years in a row, DESQview was selected as "Best PC Environment" in *PC Tech Journal's* Systems Builder Contest.

PC MAGAZINE EDITOR'S CHOICE NOV. 24, 1987

INFO WORLD 1986 AND 1987 PRODUCT OF THE YEAR

DESQview lets you have it all now.

DESQVIEW SYSTEM REQUIREMENTS:
IBM Personal Computer and 100% compatibles (with 8086, 8088, 80286, or 80386 processors) with monochrome or color display; IBM Personal System/2• Memory: 640K recommended; for DESQview itself 0-145K• Expanded Memory (Optional): expanded memory boards compatible with the Intel AboveBoard; enhanced expanded memory boards compatible with the AST RAMpage; EMS 4.0 expanded memory boards•Disk: two diskette drives or one diskette drive and a hard disk•Graphics Card (Optional): Hercules, IBM Color/Graphics (CGA). IBM Enhanced Graphics (EGA), IBM Personal System/2 Advanced Graphics (VGA)• Mouse (Optional): Mouse Systems, Microsoft and compatibles• Modem for Auto-Dialer (Optional): Hayes or compatible• Operating System: PC-DOS 2.0-3.3; MS-DOS 2.0-3.2• Software: Most PC-DOS and MS-DOS application programs; programs specific to Microsoft Windows 1.03-2.03, GEM 1.1-3.0, IBM TopView 1.1• Media: DESQview 2.0 is available on either 5-1/4" or 3-1/2" floppy diskette.

YES! I need increased productivity now!

Qty	Product	Format	Price Each	Totals
	DESQview 2.0	❑5-1/4 ❑3-1/2	$129.95	
	QEMM-386	❑5-1/4 ❑3-1/2	$59.95	
	QEMM-50/60	❑5-1/4 ❑3-1/2	$59.95	
	Shipping & Handling	$5 in USA/ $10 outside USA		
	Calif Residents add 6.5%			
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Circle 159 on reader service card

EGA or Hercules mode, for example, locks up the machines at both ends.

Being able to use off-the-shelf communications software to log on to *Remote2 Host* is a big plus, but doing so involves some compromises. For example, transmitted keystrokes and screen data aren't error checked, as they are when the calling PC uses *Remote2 Call.* Screen updates are slower, and the caller can't transfer files in the background or take screen snapshots of the host PC.

More seriously, informal tests of *Remote2* revealed a host of design flaws. For example, *Remote2 Host* had trouble answering the phone. It would let it ring ad infinitum and would not accept a correct log-on from a *Remote2 Call* system. And whenever *Remote2*'s removable 18K chat module was loaded, *1-2-3* refused to run, kicking the user back to the DOS prompt. In one case, the display on the caller's PC suffered periodic video hiccups, displaying lingering flotsam from an exited word processing screen and occasionally listing directories in a slow, jerky fashion.

At press time, Crosstalk had announced a LAN-compatible version of *Remote2* designed to run on any IBM NETBIOS–compatible link, including DCA's 10NET, Novell's *Netware*, and IBM's Token-Ring. *R2LAN* will sell for $795 per LAN, with no node limitation.

Letting garden-variety communications software do remote-access chores is a terrific idea. *Remote2* is also easy to manage, and its documentation and Microstuf's tech support are superb. But until DCA/Crosstalk irons out the program's remaining kinks, users should stick with one of its competitors.
—*Judy Getts*

WHERE TO BUY

Remote2 1.01
DCA/Crosstalk Communications
1000 Holcomb Woods Pkwy. #440
Roswell, GA 30076
800/241-6393, 404/998-3998, 404/998-8048 (BBS)
List price: Remote2 Host $129, Remote2 Call $89, $195 for both
Requirements: 128K (host module 52K, caller module 98K), DOS 2.1 or later version
Not copy protected
Technical support: unlimited, no toll-free number, M–F 9–6
Other support services: BBS, CompuServe forum (GO XTALK)
For more information, circle 674 on reader service card.

Diana Gabaldon is a teacher at Arizona State University and edits Science Software, *an international journal for scientists who use computers. Mary V. Campbell is a writer, consultant, and computer trainer in Gates Mills, Ohio. George Sheldon is a desktop publishing consultant in Mount Joy, Pennsylvania, and the author of* Illustrated Ventura 2.0 *(WordWare Publishing, Plano, Texas, 1989). Patrick Marshall is a writer for* Congressional Quarterly's *Editorial Research Reports, in Washington, D.C. Judy Getts is a contributing editor for* PC World. ●

POWER TIP NO. 32

Peruse and Use Faraway 1-2-3 Cells

Here's a way to display and use a distant cell of a large *1-2-3* worksheet. At the Ready mode, type a plus sign and the cell address or range name, then press Calc. *1-2-3* will display the current value of the cell on the control panel. Press <Enter> to store the value in the cell containing the cursor, or press <Esc> to clear the control panel and return to the Ready mode.

Jeffrey Wicks
West Orange, New Jersey

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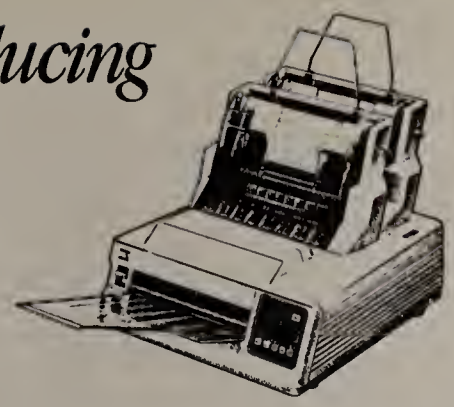

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Circle 305 on reader service card

BUS WARS

Everything you never wanted to know about PC buses but may have to ask—one of these years.

ERIC BENDER

How many angels can dance on the head of a pin?

How many bytes can zip through an advanced PC in a single second?

Are these two questions equally important to most users?

For the next few years, the answer is yes. But that hasn't precluded a heated industry debate on PC bus designs, with IBM lining up against almost everyone else. The din grew louder last fall after compatibles makers came out with an alternative to IBM's Micro Channel Architecture (MCA), dubbed Extended Industry Standard Architecture (EISA).

The debate centers on technical esoterica, with few user benefits even in sight. In the long run, the advanced hardware will make a difference—a big difference. But today, rather than selling steak or sizzle, vendors are peddling futures.

In the Background of the Bus

A PC's bus is simply the electronic backbone that swaps data among processor, memory, storage, and other components. The original PC bus nicely matched the 8088 processor, running at the same 4.77-MHz clock rate and offering an 8-bit data path. Next the AT appeared, with a 16-bit bus that also accepted original cards and ran at the 80286's 6-MHz rate, which soon climbed to 8 MHz.

This AT blueprint remains a standard, but each manufacturer is now crafting supersets because the blueprint is far from ideal. First, IBM never wrote a definitive specification. Second, vendors rapidly offered faster 80286 processors, but if the bus ran at the same speed, your add-in boards probably didn't. (That problem started manufacturers building a separate bus for the processor and memory.) Third, the 80386 came along, with its call for 32-bit pathways and even faster clock rates.

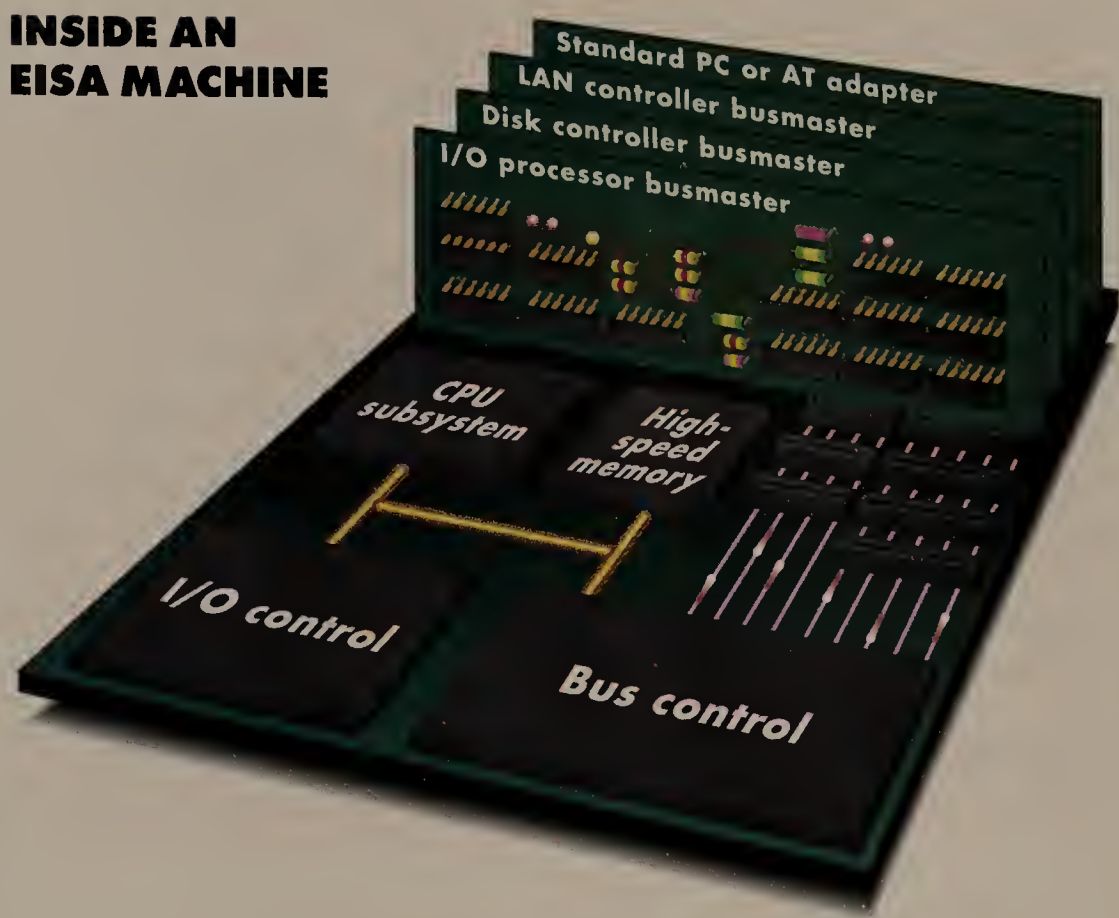
Faced with these circumstances, system designers were looking for a solid specification that would handle the need for fast 32- and 16-bit data transfers. They also wanted to accelerate upcoming multitasking system software like OS/2, support future very high performance systems incorporating busmasters (multiple intelligent devices working as peers), and minimize ever more worrisome electromagnetic interference (EMI) problems.

IBM's response was Micro Channel Architecture, which brought confusion to IBM's enemies and friends alike because the benefits were invisible to the naked eye. Hardware and software that exploit the new platform in new ways are only now starting to materialize. IBM first demonstrated a handful of unique prototypes in November; these should appear commercially by midyear.

Other vendors, who had long smarted under IBM's dominance of hardware standards, observed with some interest the PS/2's rocky road and IBM's dwindling market share and threats of legal action against MCA clone makers. Finally, last September compatibles vendors declared

their independence by bringing forth EISA. Optimized like MCA for the 80386 and future Intel processors, EISA claims equivalent or better functionality plus the ability to run existing AT cards. "The concept is so simple that it's obvious," says Rod Canion, president of Compaq Computer in Houston. Compaq and eight other hardware heavyweights were backed by Intel, Microsoft, and dozens of other systems, communications, and software vendors. Phillip White, president of Wyse Technology in San Jose, California, suggests calling EISA machines *ET's;* the first are promised for the second half of the year.

INSIDE AN EISA MACHINE



Scheduled to appear late this year, Extended Industry Standard Architecture (EISA) systems will accept PC, AT, and new 32-bit boards. The first 32-bit boards are likely to be hard disk controllers and network adapters. Busmaster add-ins will include their own processors and share the bus with the central processor. Note that the CPU and high-speed memory are linked directly rather than through the standard EISA bus.

MATT NIELSEN

Getting Throughput

The irony is that none of these vendors claims that AT-based buses are yet a bottleneck for accessing peripherals; the toughest applications typically soak up less than a tenth of the bandwidth (estimated variously at 3.5MB to 5MB per second). Instead, EISA and MCA primarily target future ultrapowerful network servers and workstations, with suitably impressive potential for raw throughput.

EISA currently claims an advantage in maximum throughput—up to 33MB per second, compared to 20MB per second for MCA. Nobody's excited about this, though, because each side clearly aims to raise the technical ante long before these upper limits are reached.

Initially, the EISA bus will run at 8.33 MHz, so transferring 4 bytes (32 bits) with each clock cycle produces a maximum rate of 33MB per second. The 10-MHz MCA bus transfers 4 bytes with two clock cycles, for a maximum of 20MB per second. However, the throughput story quickly becomes much more complicated.

For one thing, neither clock rate has been locked down forever. And plenty of other performance boosters are available—nothing in IBM's design precludes a 64-bit data path on future machines, notes Chet Heath, MCA's chief architect.

Major differences do show up in top-end memory implementations. From this perspective, "Micro Channel is a slower, lower performance bus than the AT bus," declares Andy Czernek, vice president for product marketing at Zenith Data Systems in Glenview, Illinois. He explains that PS/2s put memory on the same bus, rather than including an independent high-speed processor/memory bus, as compatible makers have done and EISA enlistees will do.

MCA machines do sneak in an option to support memory boards at the full processor clock speed. However, there's a tradeoff on the timing scheme—memory boards can operate on any MCA system, but a 20-MHz machine can't run at zero wait states unless it's equipped with ultra-high-speed, ultra-expensive memory chips.

But "there's nothing in the MCA spec to prohibit a private memory bus," says Richard Gough, manager of personal systems product support at IBM's U.S. Marketing and Services Organization in White Plains, New

Advantages of MCA and EISA Buses

- **High-speed 32-bit data transfers: greater throughput**
- **"Burst mode" data transfers: greater throughput**
- **Enhanced Direct Memory Access channels: greater throughput**
- **Busmaster support: foundation for very high performance peripherals**
- **Level-triggered (shareable) interrupts: improved multitasking support**
- **Automatic system configuration: greater ease of installation**

York. Last fall, IBM's 25-MHz Model 70 finally incorporated a separate bus with a high-speed memory cache, producing up to 32MB-per-second data transfers and zero-wait-state operation.

For more general data transfers, both MCA and EISA support data "bursting" schemes. (Employing a burst mode for disk caching, the original PS/2 Model 50 achieves passable performance despite a sluggish hard disk.) Each also can flexibly access eight direct memory access (DMA) channels and arbitrate between channels. DMA takes the load off the central processor by avoiding it for certain data transfers.

Busmasters of the Universe

Both architectures support busmasters, upcoming intelligent devices that share the bus as peers. It's far too early to tell if one approach boasts advantages over the other.

Busmasters will make for performance improvements in hard disks, network adapters, graphics cards, and other hardware. (It's important to note that these are dedicated support roles—despite IBM's spiels about "multiprocessing," we're not talking seriously about parallel processing. Such setups, in which several general-purpose processors work together on an application, are way beyond the ken of today's PC software.)

IBM has been touting busmasters since the PS/2 debuted, but only now are they beginning to appear. Gough attributes this delay to sheer technical complexity and a lack of third-party silicon support.

Competitors, however, blame the bus design, saying that only the memory-cached 25-MHz Model 70 offers a suitable PS/2 platform. Gary Stimac, Compaq's vice president of systems engineering, maintains that prototype third-party busmasters proved impractical on a 20-MHz Model 80 because the devices grabbed too much bus bandwidth from the main processor. Still, IBM's November demonstrations muted this criticism. Graphics busmasters ran quite nicely on Model 80s. And a Model 70 outfitted with two SCSI hard drive busmasters and two communications coprocessors swapped more than 16MB per second of data in the background.

Both architectures aim to shine in multitasking, partly through "shareable interrupts." (PCs grab hardware resources through interrupts; multiple tasks may generate conflicting interrupts unless the hardware is designed to handle the problem. With MCA or EISA—we're really deep in the nitty-gritty here—an interrupt can be triggered by a certain level of current, rather than a spike in the current.)

The two architectures differ radically in strategies for handling electromagnetic interference, which grows exponentially as clocks speed up.

IBM keeps predicting that the Federal Communications Commission (which regulates devices that produce EMI) is about to slap AT bus machines with speeding tickets. MCA handles grounding issues much more carefully, cutting EMI to less than one-third, IBM says. "That's not something you can program around; it's based on physical placement of the pins," Gough insists. He predicts that other methods will require clumsy metal shields to solve the problem.

Some knowledgeable outsiders do give MCA the edge here. EISA will top out at about 40 MHz, while the upcoming 80486 is likely to run much faster, forecasts Carl Warren, head of Warren Group Labs in Torrance, California.

But Compaq's Stimac responds that the problem requires nothing more than normal, careful systems engineering. And while IBM's theory sounds good, it hasn't shown practical results, according to Kevin Mankin, Zenith's director of product development. He points out that the 25-MHz Model 70 originally shipped without meeting full FCC Class B requirements.

Similarly, IBM has talked big on reliability, but outsiders haven't seen the evidence. In fact, when PS/2s first came out "reliability really was average to poor for a long time," reports Michael Smith, managing director for product acquisitions and programs at Entre Computer Centers in McLean, Virginia.

By common agreement, MCA's support for configuring add-ins without DIP switches is a winner. EISA will duplicate this functionality—it's a trivial task, says Mankin, once vendors unite on EISA.

Card-Carrying Customers

With EISA still residing on paper and unique MCA enhancements just beginning to appear, it's way too early for definitive comparative judgments. But does the industry expect massive differences in functionality? "Nothing that's dramatic," says Rich Bader, co-manager of Intel's Personal Computer Enhancement Operation in Hillsboro, Oregon.

DUELING BUSES

IBM and rivals redesign the AT hardware blueprint.

	EISA	MCA	AT
Supports existing AT cards	Yes	No	Yes
Open system architecture	Yes	No	Yes
Maximum throughput (MB/second)	33	20	3.5[1]
Maximum memory addressing (MB)	4096	4096	16
Maximum DMA addressing (MB)	4096	16	16
Current clock speed (MHz)	8.33	10	8
Size of board (square inches)	63	35	63

[1]Estimated throughput varies and will increase in the future. The figure for the AT bus is IBM's; existing 80386 supersets of the bus may work several times faster.

"One may have a little bigger bell, one may have a little bit better whistle, but they're fairly equivalent," agrees Tim Cutler, director of product marketing at Quadram in Norcross, Georgia. "We're seeing a little bit of a specsmanship game."

The one major difference between the architectures involves the knack of running existing AT cards. If EISA can achieve that without making sacrifices elsewhere, it's got a clear edge. "The ability to use existing cards is an advantage; nobody denies that," acknowledges IBM's Gough. "But how likely are people to take their existing cards and migrate them from the existing ATs?" As another IBM exec puts it, that would be like buying a new car and keeping your old tires.

However, the ability to run existing cards is not EISA's biggest plus, says Andy Verhalen, marketing director for distributed systems at 3Com in Mountain View, California. Instead, Verhalen says, EISA's greatest advantage is letting customers choose among a broader selection of lower cost boards. And they're not locked in with a single system vendor.

IBM's Heath warns against mixing old and new cards in an EISA machine, saying that will reduce the entire machine to the level of an AT and create knotty problems in multitasking. But Zenith's Mankin shrugs off that threat. "They're designed to coexist—that's the whole approach."

Throwing Third Parties?

For either system to be successful, third-party board manufacturers, chip makers, and system software and application developers must sign up. So far, many vendors are marching in both parades—helping to establish dual standards.

Mankin expects EISA to reprise the scenario already seen with AT-specific boards—first disk controllers, then network and graphics offerings, and then everything else.

Bader cautions, though, that for the foreseeable future the largest portion of the installed base will consist of AT compatibles. That leaves board manufacturers with a clear focus: "If we can make things happen on the classic bus, we will."

Take Intel's Connection Co-Processor, Bader says. There's one example of greater functionality that's "not impossible to do in classical bus; you just have to make an extra effort." The Co-Processor acts as an intelligent slave, working in the background and taking a load off the processor. A 32-bit data pathway would not improve performance discernibly.

Both MCA and EISA now enjoy support from crucial silicon vendors, particularly Intel, and from Microsoft. At first, EISA "will be very easy for us to support," says Steve Ballmer, Microsoft's vice president for system software; "the operating system has no specific knowledge of the underlying bus." However, system software must evolve to offer well-defined standard routes to higher plateaus like busmasters; Microsoft will work with both IBM and EISA backers to make that happen.

Application software developers are mostly isolated from bit-twiddling on the new buses, and that's the way they want to keep it. "Developers are going to fight a constant battle to keep the hardware environment as standard as possible," predicts Jeffrey Tarter, publisher of *Softletter* in Cambridge, Massachusetts. Many software houses have endorsed EISA enthusiastically, because they see it offering a smooth migration path.

Who Needs It?

Robert Carberry, vice president for systems at IBM's Entry Systems Division, feels that busmasters may prove particularly handy for upgrading moderate-performance machines. But both MCA and EISA mainly target the emerging high-performance 32-bit world, and the hardware will carry a cost premium. Who will really need all that muscle?

Anyone who buys a top-end 386 machine today, says Gough, and wants it to handle whatever might come up in the next three to five years. MCA itself was devised to last ten years, he adds; within that time, desktop machines will do "virtually anything you can do with mainframes today."

Even the most powerful of today's 25-MHz 386 systems haven't bumped into bus limits, says Zenith's Mankin, "but above 25 MHz, people really need to think about whether to tie themselves to the AT bus." The 33-MHz 386 will crop up just about the time EISA appears, in one of those happy coincidences marketers enjoy so much.

In a few years, the new architectures' technical prowess may not seem so excessive. "You'll hear, 'I've got 16MB in my PC and I can't do a thing,'" predicts Judith Hurwitz, senior analyst at Patty Seybold's Office Computing Group in Boston. Developers will be pushing graphics, audio, and video, she says. "That's when the architecture will start being tested."

At that point, the bus wars will be more than a vendor power game, more than posturing for power users. But for most customers, purchasing decisions shouldn't slavishly follow along bus lines—it's too early to worry that the bus will leave without us. ●

Eric Bender is PC World's *East Coast editor.*

POWER TIP NO. 33

Correct Your WordStar Dictionary

Oops! You just saved a misspelled word to your *WordStar 4.0* or *5.0* personal dictionary. The documentation neglects to mention that *WordStar* creates personal dictionary files in ASCII. You can correct the errant entry by simply editing the contents of the file.

Start *WordStar*, press **N** to open a nondocument file, type **Personal.dct**, and press **<Enter>**. Next press **<Ctrl>-QF** to search for the misspelling, or scroll through the dictionary list to find the misspelled word. Make the correction and press **<Ctrl>-KD** to save it.

Rex Farrance
Assistant Editor

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TEXAS INSTRUMENTS

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Insurance would help with the hardware, but it couldn't reconstruct the data. Lasher's data backup was more than two months old. Not only had the company lost its accounting records, but now there was no way to keep track of drivers, deliveries, schedules, and maintenance. John Lasher quickly went out of business.

BLANKET SECURITY

Computer crime is on the rise, but PC users are fighting back with extra-strength security precautions.

Lewis Perdue

Arlen Kelley, who runs a mailing house in Los Angeles, had better luck. "I got a call from the janitors about 2 a.m.," related Kelley. "They said the PCs were screaming at them. I knew those were the AlarmCards I had installed just a month before." When he arrived on the scene, he saw that his four PCs had all been moved slightly, setting off the AlarmCards' motion detectors. Fortunately, he had also cabled the PCs to their desks. "Somebody tried to cut through one of the cables with a bolt cutter," said Kelley. "But the wires just spread out, and with all the noise, they gave up."

Stories like these are heard from businesspeople every day. PCs and peripherals are the most frequently stolen kinds of office equipment, according to the National Crime Information Center. Safeware Insurance, a company that underwrites policies for PCs and data, reports that more than 137,000 PCs were stolen in 1986, resulting in losses of over $154 million. Even more devastating is the theft and destruction of data. According to a study by *American Office Dealer*, 43 percent of businesses that lose their data by theft or fire go out of business within six months.

A recent FBI study estimates that only 5 to 20 percent of computer frauds and thefts are reported. Like the businesspeople mentioned above, whose names have been changed for this story, most victims are hesitant to draw attention to themselves. They fear that publicity might provoke more burglaries or that their insurance companies may increase their rates or cancel their policies.

Nevertheless, people are battling back against computer crime, armed with a growing arsenal of PC security defenses. These range from cabinet locks that physically clamp your PC to a desk, to elaborate encryption and password protection software.

SECURITY—WHO NEEDS IT?

Although computer viruses steal the headlines these days, theft of both hardware and data are far more common threats. Industrial espionage and employee sabotage are growing problems, and no company can ignore the risk of old-fashioned hardware theft. Some security schemes protect data against the innocent; in the wrong hands, innocuous-looking DOS commands such as FORMAT can turn into system killers.

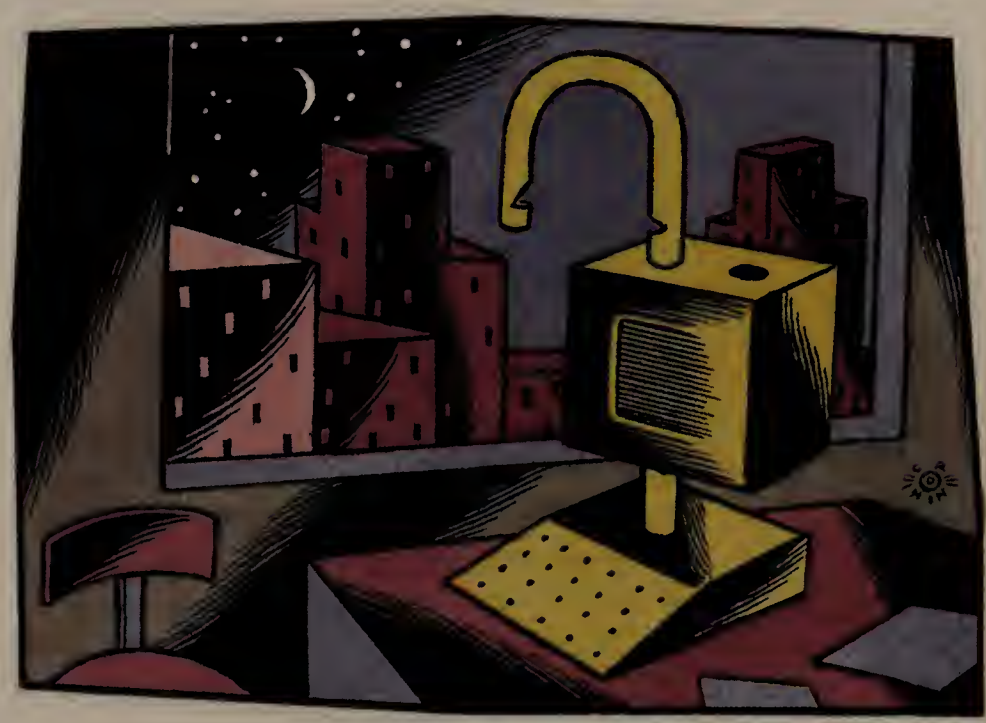
Who needs PC security, and how much security is enough? All most PC users need is a keylock that locks both the keyboard and the chassis and an encryption program that guards sensitive correspondence and financial data. Users whose PCs are home to accounting, payroll, and personnel files or harbor classified data or trade secrets may want to move up to a full-fledged security package that offers elaborate password and permission controls in addition to encryption. And any office lacking top-notch building security should consider cabling PCs to desks.

Chances are, you and your PC are underprotected. However, bear in mind that security costs money, and security measures that restrict flexibility could lead to frustration and decreased productivity. Offices that tightly control system resources are better suited for elaborate security measures than offices where users are masters of their own PCs.

LOCKS AND ALARMS

For most PC users, security precautions stop after a turn of a front panel key. Most new systems have keylocks, but don't be lulled into a false sense of security. Many keylocks control keyboard access but don't lock the chassis; if someone can open up the system unit, they can disengage the lock—and gut the PC for good measure. Disk drives and expansion boards are easy to steal, and with the high price of easily removable DRAM chips, don't be surprised to find your multimegabyte dream machine suddenly reduced to an unpopulated fixer-upper.

Still, even keylocks that lock only system access are a good first-line defense, and they



BRIAN CRONIN

can also be used to make sure the system doesn't boot—an important consideration for LAN servers and dedicated bulletin board systems. If your PC lacks a keylock, you can add one yourself, such as the PC Guardian Model 201 sold by Micro Security Devices.

Even if a keylock secures the PC's chassis, your system may still be a sitting duck. If your office security is less than perfect, PCs and peripherals can easily be walked out the door. Fortunately, a number of vendors offer locking systems that not only lock the chassis but secure the system unit itself by cabling it to the desk.

Most locking systems rely on wire cable and padlocks similar to those used to secure bicycles. For example, with the PC Guardian Model 400 you can cable the system unit, keyboard, monitor, and peripherals to a mas-

ter cable attached to a desk or other solid object. A padlock secures the entire assembly. Similar locks include The Guard from Pentagon Systems and The Kablit System from Secure-It.

For monitors or printers that lack secure screws, Micro Security Devices offers the Perma-plate, a plate-mounted cable fixture that is permanently attached with cyanoacrylate glue. Other vendors go a step further by bolting units to the desk. Though undeniably effective, bolting and gluing make your system hard to move.

An additional deterrent is the AlarmCard, an expansion board that contains a motion sensor and battery-powered siren. Try to move the PC without disabling the alarm with a password, and the unit shrieks. However, expansion card devices are vulnerable unless you also have a cabinet lock.

REMOVABLE MEDIA

Once you've physically protected your PC, the next task is to shield the data itself. One simple and dependable method is to use removable media that can be locked away in a safe, vault, or secure filing cabinet.

The ability to stash your primary media gives you an extra security edge. The wide range of removable primary media includes Bernoulli Boxes, removable hard disks such as the Plus Development Passport and Tandon Data Pac, and removable Winchester cartridge drives from vendors such as Sysgen and IDEAssociates. One slight hitch: Although removable media keeps your data safe while you're away, its very removability makes it vulnerable while it's in your PC.

E%N#C@R~Y*P^T+I|O\N

If your hard disk is stuck fast in your PC, you'll need to turn to other schemes. Masking your data with file encryption is the most common solution. Encryption draws upon complex mathematical formulas known as algorithms to scramble a file so that it appears as digital garbage; only those with the proper password can decrypt it.

Built into programs such as *WordPerfect*, *dBASE III Plus*, *R:base 5000*, *Keyworks*, and *SuperKey*, encryption is also available in stand-alone packages such as Software Directions' *SoftSafe* and Pentagon Systems' *The Mask*. Most programs require that you encrypt data one file at a time; more sophisticated versions automate the process, letting you encrypt every file in selected subdirectories by typing a single password.

An effective encryption facility should meet or exceed the 56-bit specification of the National Bureau of Standards' Data Encryption Standard (DES). Yet the success of encryption relies more on the disciplined use of passwords than on the complexity of the algorithm. Although you will want a password you'll remember, too many people choose passwords that are easy to guess. Avoid names, common phrases, slang, inside jokes, birth dates, anniversaries, license numbers, or vital statistics. People frequently choose passwords that are too short—six characters should be the minimum. Passwords should also be changed frequently.

WHAT'S THE PASSWORD?

Many security packages go beyond file encryption to offer a battery of extra-strength safeguards. Generally, full-fledged packages such as Fischer International's *Watchdog*, Enigma Logic's *PC-Safe II*, and the somewhat less sophisticated *SoftSafe* are targeted at offices dealing with highly sensitive data or where PCs are shared by multiple users.

In addition to encryption, the packages offer password control for system entry. *Watchdog* also restricts entry to particular subdirectories by user and lets you set permission levels for each user to read and write to files, read only, write only, or create and delete new files. Administrators can also instruct *Watchdog* to prevent users from accessing DOS, thus preventing misuse of potentially dangerous commands such as FORMAT and DELETE.

Other advanced features to look for include password-controlled screen-blanking utilities, programs that limit system access to particular hours and days, and, most important, an audit trail feature that lets managers keep track of system entries by subdirectory. For example, *Watchdog* records all system and file access and can even detect failed attempts. Recurring attempted file ac-

cess or unusually frequent log-ons may indicate unauthorized use. To bar hackers from bypassing security software, you should choose a package that prevents the system from being booted from a floppy disk.

BOOT AND LET BOOT

Aspiring 007s can pick up even more advanced products to protect their PCs. The latest trick is to use a combination of hardware and software keys to protect access. For example, *PC-Safe II* comes with a credit card–size token that generates unique algorithms with every use. After you've entered your regular password at the keyboard, the program displays a numerical "challenge." At this point, you pull out your trusty token and type the challenge along with your personal identification number into the token's tiny built-in keypad. The token computes and displays the response, and you type it in on the PC's keyboard. If the token's calculation matches that made by the PC, you're in.

ThumbScan's Gordian Access Key goes one step further. To gain access, you type in a user password that causes the PC's screen to flash a random display indecipherable by the human eye. A domino-size device held by the user visually reads the display and calculates and displays the proper code response. The user then types in the number on the keyboard to gain access.

If you don't trust passwords and cryptology, what will you trust? How about your own body? Biometric authentication systems are appearing that compare unchanging human qualities such as fingerprints and retinal scan rates. The $995 ThumbScan scans a user's thumbprint and compares it to a previously made imprint. A perfect match lets the user access the PC. ThumbScan also sells a $210 expansion board–based general security system called PC Boot.

ONE STEP AHEAD

To keep a step ahead of the hackers, security technology is constantly changing. You can keep up to date by contacting the Computer Security Institute. Members receive a monthly newsletter, a security buyers' guide, a handbook for setting up a security system, a scholarly journal, and access to seminars and conferences.

Maintaining PC security requires a delicate balancing act between protecting computer resources and serving the convenience of the user. Yet with careful planning and implementation, you can safeguard your business while benefiting from the free exchange of information. ●

Lewis Perdue is the editor and publisher of PC Management Letter *and the author of* Supercharging Your PC *(Osborne/McGraw-Hill, Berkeley, California, 1987).*

FOR MORE INFORMATION

AlarmCard
Danor Corp.
14700 N.E. 8th St. #205
Bellevue, WA 98007
206/747-0824
List price: $89.25
Reader service no. 630

Computer Security Institute
360 Church St.
Northborough, MA 01532
617/393-2600
Membership price: $95
Reader service no. 631

The Guard 1-A, The Mask
Pentagon Systems, Inc.
3683 Enochs St.
Santa Claro, CA 95051
408/738-2621
List price: The Guard 1-A locking ond cabling system $26.95, The Mask $149
Reader service no. 632

The Kablit System
Secure-It, Inc.
18 Mople Ct.
Eost Langmeadow, MA 01028
800/451-7592,
413/525-7039
List price: $49.95
Reader service no. 633

PC Guardian
Micro Security Devices, Inc.
118 Alta St.
San Rafael, CA 94901
800/882-7766,
415/459-0190
List price: PC Guardian Model 400 chassis-lacking device (far IBM models and their peripherals) $29.95; cable far Madel 400 $14.50; PC Guardian Madel 1675 cabling system (for nanstandord PCs, includes one cable) $37.95; PC Guordian Perma-plate $12.95; Model 201 system lack $64.95
Reader service no. 634

PC-Safe II
Enigma Logic, Inc.
2151 Salvia #301
Concord, CA 94520
415/827-5707
List price: $275
Reader service no. 635

SoftSafe
Saftware Directions, Inc.
1572 Sussex Turnpike
Randalph, NJ 07869
800/346-7638,
201/584-8466
List price: $99
Reader service no. 636

ThumbScan, Gordian Access Key
ThumbScan, Inc.
335 Eisenhawer Lane S.
Lombard, IL 60148
312/932-8844
List price: ThumbScan $995, Gardian Access Key $75, PC Boot $210
Reader service no. 637

Watchdog
Fischer Int'l
P.O. Bax 9107
4073 Merchantile Ave.
Naples, FL 33942
800/237-4510,
813/643-1500
List price: $295
Reader service no. 638

PERSONAL TAX PREPARATION SOFTWARE

If your tax preparation requirements fall somewhere between Form 1040-EZ and the services of a high-priced lawyer, one of the tax return programs listed here can be a great help. All are designed for individuals rather than companies, and all support the essential IRS forms.

To pick a tax program, first determine how closely you fit one of the following general categories: renter, homeowner, self-employed, or investor (for details, see the sidebar "A Taxpayer Bestiary"). Next check whether the program supports the specific IRS forms you need (see the table "Additional IRS Forms Supported"). Then look for any special features you might like. *TaxView*, for example, runs under *Microsoft Windows; TurboTax* supports 41 state tax returns.

Using a computer program to prepare your personal income taxes can enliven an otherwise grueling process. It's especially interesting when you play "what if" with your income.

Most of the programs listed let you do "what if" analysis, an enlightening exercise in money juggling in which you vary your income figures to see how changes affect your tax liability. On the most basic level, you change an entry in your return, recalculate, then check the bottom line. Problem is, you have to change the numbers back later on. Programs with a more advanced "what if" feature typically let you create one or more copies of the return, where you can fiddle the figures without disturbing your original data.

For printing the results of your labors, all the programs listed meet IRS specs. Forms may be printed on any kind of paper, except for the 1040, which must be an exact facsimile. To create it, many programs use preprinted, pin-feed 1040 forms, or a transparent plastic overlay that you sandwich with your printout for photocopying. Some programs can create facsimiles of the 1040 on dot matrix and even laser printers, but except for *TurboTax*, they require a special font cartridge.

Alan Southerton
and
Cameron Wicker

STAND-ALONE PROGRAMS

Andrew Tobias' Managing Your Taxes

• Renter • Homeowner

Fans of Andrew Tobias will likely jump at the financial guru's *Managing Your Taxes* (formerly Best Programs' *PC/TaxCut*). But while the program meets the average taxpayer's requirements, *Managing Your Taxes* allows only two Schedule C attachments (profit or loss from business or profession) and three Schedule E properties, and it doesn't let you write expanded entries to explain to the IRS how you arrived at the numbers you entered.

Managing Your Taxes offers a slick interface and performs computations quickly, constantly updating information across all forms. It's easy to change an entry and examine its effect, but the program offers no special "what if" capabilities. *Managing Your Taxes* carries a good selection of forms but lacks worksheets in which to do supporting calculations. It offers full printer support, including pin-feed and overlay 1040s, and produces facsimile 1040s on both dot matrix and laser printers.

Ask Dan About Your Taxes

• Renter • Self-Employed
• Investor • Homeowner

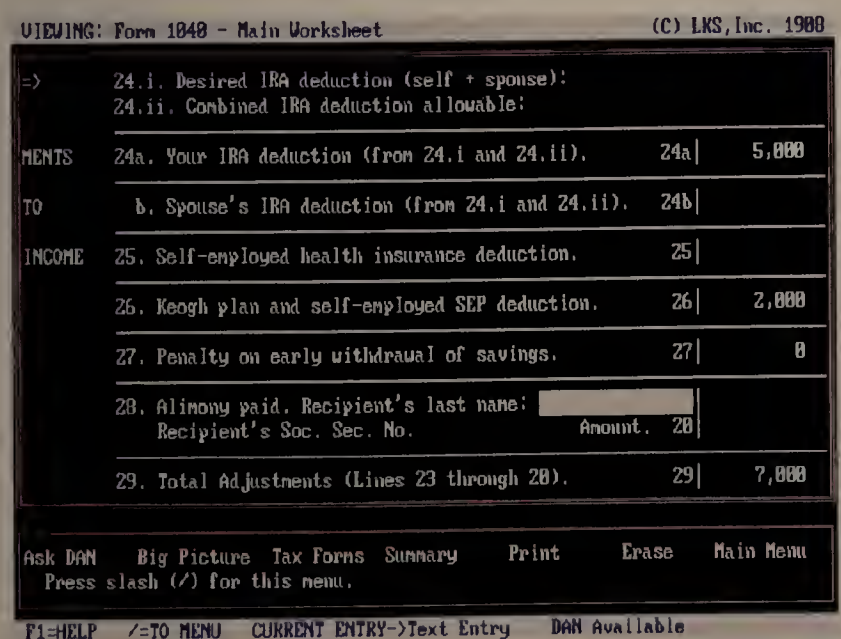
An expert systems program, *Ask Dan About Your Taxes* won't make doing taxes a joy, but it can salve some of the sting. Once you supply some basic data—on salary, marital status, and dependents—the program's interactive Ask Dan feature begins to answer subsequent questions and suggests which forms your return requires. *Ask Dan About Your Taxes* also lets you do "what if" comparisons of up to 30 alternative tax returns without disturbing your original data.

Ask Dan About Your Taxes offers a hefty number of integrated worksheets, including ones for IRA deductions, dependents, depreciation, and passive activity losses. The program doesn't automate everything, however. For example, it doesn't link results from Form 8582 (passive activity loss limitations) to appropriate schedules. *Ask Dan About Your Taxes* provides a good selection of forms. Printer support is limited to pin-feed and overlay 1040 forms. State returns are available for California, Massachusetts, and New York.

J. K. Lasser's Your Income Tax

• Renter • Homeowner

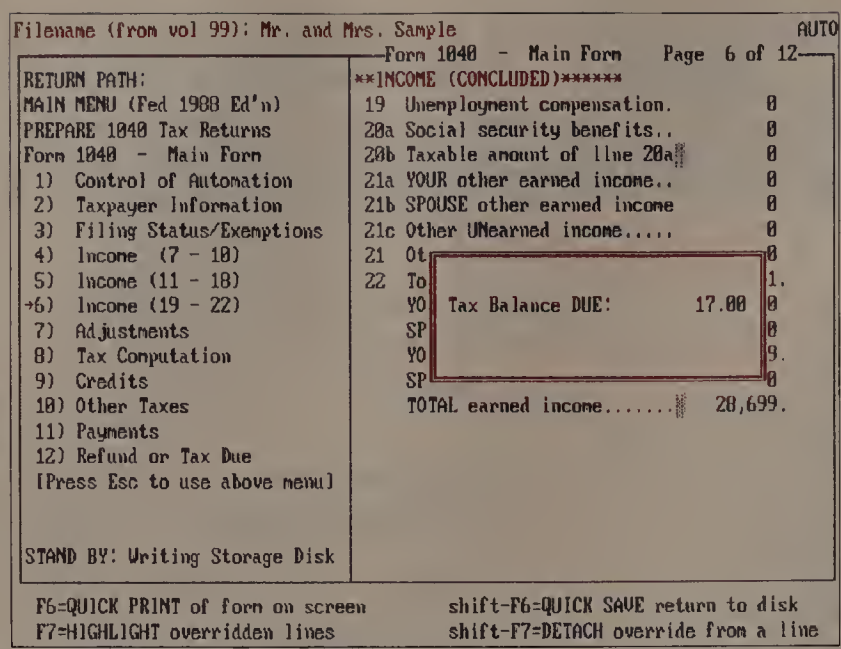
J. K. Lasser's Your Income Tax supports a respectable array of IRS forms and supplies supplementary materials (including a useful tax guide). It also offers a slick pop-up/pulldown menu interface and quick access to IRS instructions. The package handles up to 20 depreciable assets (the program's top limit on Form 4562 for depreciation and amortization), and six Schedule E properties. As for worksheets, the program handles forms for IRAs, passive activity, and social security, among others, and links amounts to other forms. In addi-



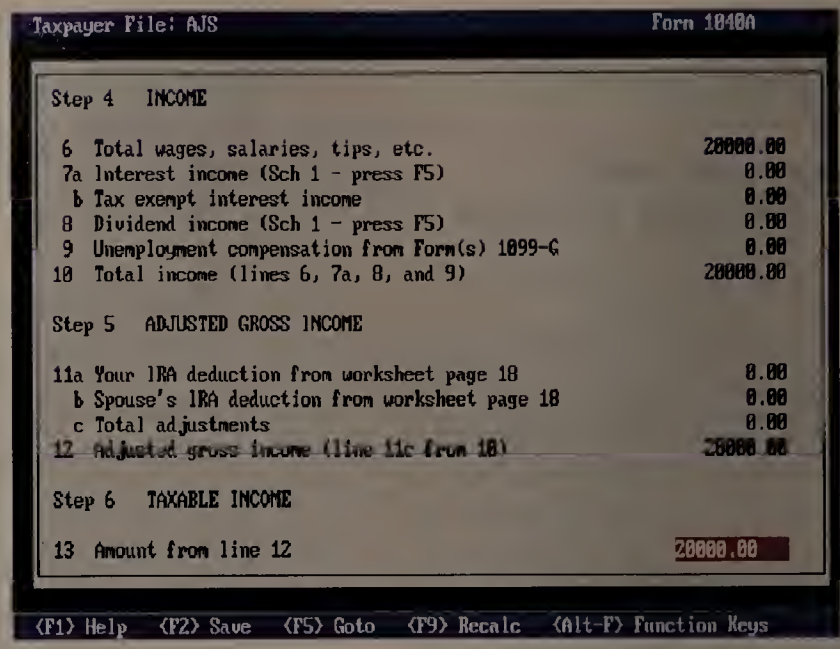
In Ask Dan About Your Taxes, the 1040 screen form resembles a hard copy 1040 and features a system menu at the bottom of the screen.

This partial display of Form 1040 in EZ Tax-Prep, a 1-2-3 template, features 1-2-3–like menus at the top of the screen. The Other Forms menu option lets you move quickly between forms and schedules.

JAVIER ROMERO



Tax Preparer displays the program's "what if" feature on the left, and part of a 1040 on the right.



Swiftax is one of a few programs that includes Form 1040A for taxpayers who don't have to use Form 1040.

tion, a handy notepad lets you create explanatory form attachments.

Your Income Tax's special "what if" capabilities let you compare two 1040 scenarios, and can help married couples decide whether to file jointly or separately. The program handles pin-feed, overlay, and dot matrix 1040 facsimiles. Optional state returns are limited to California and New York.

Personal Tax Filer

• Renter • Homeowner

Sporting a modest $19.95 price tag, *Personal Tax Filer* supports a core set of schedules and forms and covers all of a homeowner's standard tax situations, including the sale of a house.

If you opt for *Personal Tax Filer*, you do lose a few niceties. Not only does the program lack any supplementary tax-related literature, but its terse documentation appears only on disk. *Personal Tax Filer* won't let you assign unique file names to tax returns, so you must use a separate disk for each return you prepare. The program also lacks online IRS instructions and a way to create explanatory attachments. *Personal Tax Filer* supports pin-feed and overlay 1040 forms as well as dot matrix 1040 facsimiles.

Swiftax

• Renter • Homeowner

Swiftax (formerly *Sylvia Porter's Swiftax*) is designed for taxpayers with average needs. New in the 1988 version are four specialized worksheets, including worksheets for pensions and annuities and for excess social security taxes. *Swiftax* also offers context-sensitive help and keyboard shortcuts that automatically put you in a given form. The program has no special "what if" capability.

Self-employed people may find *Swiftax* limiting unless they can make do with three Schedule C forms and only five allowable depreciable assets. Homeowners can use *Swiftax* unless they sell their house, since the program doesn't support Form 2119 (sale or exchange of principal residence). *Swiftax* supports pin-feed and overlay 1040s as well as dot matrix and laser facsimiles.

The Tax Advantage

• Renter • Homeowner

The Tax Advantage is an easy-to-use menu-driven program for federal and California returns, but it isn't diverse enough for all investors or the self-employed. The program automatically updates your tax after every new entry, summarizes taxpayer data, and provides up to 50 itemizations for entries that require expanded information. You can do a basic kind of "what if" analysis by overriding current entries and itemizations, then viewing the results in a pop-up summary screen, but you must reenter the original data.

The Tax Advantage imports data from Monogram's *Dollars & Sense*, *Andrew Tobias' Managing Your Money*, and Arrays' *The Home Accountant*. *The Tax Advantage* also supports worksheets for social security benefits and IRAs. The program handles pin-feed and overlay 1040 facsimiles.

Tax Preparer

- Renter
- Self-Employed
- Investor
- Homeowner

Tax Preparer is a professional tax preparation and planning program, but vendor HowardSoft actively markets its $295 package to individuals. Like some other professional packages, *Tax Preparer* is written in BASIC and requires that the BASIC interpreter be located in the same subdirectory as the program.

Tax Preparer offers a good selection of forms, and links results between all necessary schedules and forms. The program allows five copies of Schedule C, unlimited Schedule D sales, and unlimited Schedule E properties. The program walks you through appropriate schedules and forms to perform "what if" analysis, but still requires manual reentry of data. It also handles pin-feed and overlay 1040s as well as laser graphic 1040 facsimiles. State filing is limited to an optional module for California only.

TaxView

- Renter
- Self-Employed
- Investor
- Homeowner

If you're used to the fine print of IRS forms, *TaxView* could be for you. The program runs under *Microsoft Windows* and gives you true-to-life on-screen display of its generous assortment of IRS forms.

The program is heavily oriented toward worksheets, so you can review your return and know how you calculated, say, depreciable assets. For these—as well as passive activity losses—the program automatically links relevant amounts to other appropriate forms and schedules. A summary window displays your current tax refund or liability at any given point.

TaxView's "what if" function is simple but useful: You enter theoretical figures, which you can delete after you finish your analysis. Printing is equally simple, since all forms are printed as exact IRS replicas. California and New York modules are available. A $119 companion product, *TaxView Planner*, is also available for one- to five-year tax planning.

TurboTax

- Renter
- Self-Employed
- Investor
- Homeowner

A 1988 World Class PC award winner, *TurboTax* is one of the most popular tax software packages available. It supports 41 state modules and features an alternative tax worksheet that lets you create four different tax returns for comparison. The worksheet is supported by a "what if" menu to manipulate data quickly. This and other menus are invoked using the familiar *1-2-3* slash-key convention.

The program automatically recalculates your tax when you update an item. If you used *TurboTax* last year, the program carries over personal data and depreciable assets using a simple transfer command. The program also automatically updates estimated tax for next year and lets you maintain extended explanations of entries, which can be printed separately. Other notable features include room for eight Schedule E properties, on-line help and IRS instructions, and a pop-up window that shows the current tax payment/refund (as well as other data) from anywhere in the program. *TurboTax* offers several print options and

A TAXPAYER BESTIARY

To find a program tailored to your tax situation, see which of the following profiles most closely matches yours.

Renter. Single person or married couple with full- or part-time job(s). One or both probably need to file Schedule C to report some business income, but don't have enough deductions to require Schedule A (itemized deductions).

Homeowner. Usually a married couple with children, two jobs, and some extra income. Schedule C may or may not be needed, but Schedule A is a necessity. Schedule D is also handy for deferring otherwise taxable gain that results from moving up in the housing market. Forms required include 2119 (sale or exchange of principal residence), 2441 (child-care credit), and 3903 (moving expenses).

Self-Employed. Typically a professional or a business person for whom Schedules C and SE (social security self-employment) are key. So is Form 1040-ES, a worksheet for calculating estimated tax.

Investor. This taxpayer has one or more homes and substantial investments, with possible passive activity from deals in securities, real estate, oil and gas partnerships, even movies. Depreciable assets are another concern. Required forms include 3800 (general business credit), 4562 (depreciation and amortization), 4952 (investment interest expense), 4972 (lump sum retirement income), 6251 (alternative minimum tax), 6252 (installment sale income), 8582 (passive activity loss limitations), 8606 (IRA contributions, basis, and distributions), and 8615 (tax for children under 14 with income over $1000).

ADDITIONAL IRS FORMS SUPPORTED

The tax programs listed below all support a core set of schedules and forms that includes A, B, C, D, E, SE, 1040, 2106, 2119, 2441, 3903, and 8615. The following table shows any additional schedules and forms supported.

Andrew Tobias' Managing Your Taxes
Core, F, 1040-ES, 2210, 3468, 4562, 4797, 4952, 5695, 6251

Ask Dan About Your Taxes
Core, F, R, 1040-ES, 2210, 4562, 4684, 4797, 6251, 6252, 8582, 8598, 8606

EasyTax
Core, R, 4562, 6251, 8582

Executive Federal Tax Template
Core, 4562, 4972, 6251, 8582, 8598

EZTax-Prep 1040
Core, F, R, 1040-ES, 2210, 3800, 4562, 4684, 4797, 4952, 4972, 6251, 6252, 8582, 8598, 8801

J. K. Lasser's Your Income Tax
Core, F, R, 1040-ES, 2210, 3468, 3800, 4137, 4255, 4562, 4684, 4797, 4868, 4952, 4972, 5329, 6251, 6252, 8582, 8606

Personal Tax Filer
Core 4562, 4972, 6251, 8582, 8598

Swiftax
Core, F, R, 1040-A, 1040-EZ, 4562, 6251

The Tax Advantage
Core, F, R, 4562, 6251, 8598

Tax Ease
Core, F, R, 1040-X, 2210, 2210F, 3800, 4136, 4255, 4562, 4797, 4952, 4972, 6251, 6252, 8582, 8598, 8606

Tax Preparer
Core, F, R, W2, W2-P, 1040-ES, 2210, 3468, 3800, 4562, 4797, 6251, 6252, 8582, 8598

TaxView
Core, F, R, 1040-A, 1040-EZ, 1040-X, 1116, 2210, 2555, 4562, 4684, 4797, 4952, 6251, 6252, 8283, 8582, 8598, 8606, 8801

TurboTax
Core, F, R, 1040-ES, 2210, 3800, 4255, 4562, 4684, 4797, 4952, 4972, 6251, 6252, 8582, 8598, 8606

can create 1040 facsimiles on Hewlett-Packard laser printers without requiring a font cartridge or downloadable fonts. The program supports laser and dot matrix facsimiles as well as pin-feed and overlay 1040s.

SPREADSHEET TEMPLATES

EasyTax

- Renter
- Self-Employed
- Investor
- Homeowner

EasyTax includes a generous selection of IRS forms, a built-in tax planner, a nifty analyst feature that compares your tax return to IRS statistics, and a unique W-4 worksheet to help you determine withholding allowances for the new year.

You control *EasyTax* from an extensive command menu in each of the template's nine spreadsheets; results are linked between forms. You enter depreciable assets directly into Form 4562, for example, and they are transferred automatically to other forms. This is also the case for passive activity losses and their limitations reported on Form 8582. The program supports Form 1040-ES, which self-employed people and investors can use to file their estimated tax. At all times, *EasyTax*'s "Taxometer" displays your current refund or tax liability. *EasyTax* supports pin-feed and overlay 1040 forms. Templates for New York, California, New Jersey, and Pennsylvania are available.

Executive Federal Tax Template

- Renter
- Homeowner

Consisting of a structured worksheet contained within a single file, this *1-2-3* template sells for a bargain $14.95. In addition to an adequate selection of forms, the template supports worksheets for dependency status and social security benefits as well as a tax refund/liability summary section.

The template's command menu includes options to recalculate, save copies of the template, and access print functions. Data calculated in one part of the template flows to appropriate other sections, but you must manually enter amounts from Form 4562 (depreciation and amortization) in Schedules C and E and Form 2106 (employee business expense). *Executive Federal Tax Template* supports pin-feed and overlay 1040 forms only. State return templates for New York and California are available.

EZTax-Prep 1040

- Renter
- Self-Employed
- Investor
- Homeowner

Your home base in *EZTax-Prep 1040* is the program's 1040 worksheet, from which you can call up any of 27 other worksheets, including worksheets for IRA information, passive activities, depreciation and amortization, and taxable social security.

EZTax-Prep automatically links results across all forms. It can handle eight Schedule C worksheets, supports expanded entry areas, and provides a supplemental worksheet for Schedule D. The only "what if" analysis requires manual reentry of amounts, but you can combine this with tax planning using the company's $95 *EZTax-Plan* (which, depending on system memory, can look ahead 40 years). *EZTax-Prep* also offers a feature that compares your re-

turn to IRS statistics, so you can weigh your chances of being audited. The program generates laser 1040 facsimiles (with an optional HP font cartridge) and pin-feed and overlay 1040s. State software is available for California, New York, and Pennsylvania.

Tax Ease

- Renter
- Self-Employed
- Investor
- Homeowner

Tax Ease is a template for such spreadsheets as *1-2-3*, *VP-Planner Plus*, and *Quattro*. The template handles a bevy of forms and provides on-line help and IRS instructions. *Tax Ease* lacks worksheets for IRAs and passive activities, and doesn't link data for depreciable assets and passive activity losses to the related forms and schedules. *Tax Ease* also omits Form 1040-ES for estimated tax.

Tax Ease lets you review your current tax refund or liability instantly, and it can simultaneously display federal and state tax forms for 25 states. *Tax Ease* prints pin-feed and overlay 1040s but not facsimiles. The companion *Tax Planner* three-year tax planning program is also available for $79. ●

Alan Southerton is a freelance writer who is currently finishing a book on programming the OS/2 Presentation Manager. Cameron Wicker is a tax attorney and partner in a law firm specializing in tax, trust, and probate matters.

WHERE TO BUY

STAND-ALONE PROGRAMS

Andrew Tobias' Managing Your Taxes
MECA Ventures Inc.
355 Riverside Ave.
Westport, CT 06880
203/226-2400
List price: $79.50, annual upgrade $45.50
Requirements: 312K, two disk drives, DOS 2.1 or later version
Reader service no. 601

Ask Dan About Your Taxes
Legal Knowledge Systems Inc.
1215 Belfield Ave.
Drexel Hill, PA 19026
800/338-1866, 215/446-5470
List price: $89.95; annual upgrade $44.95; California, Massachusetts, and New York modules $12.95 each
Requirements: 512K, two disk drives, DOS 2.1 or later version
Reader service no. 602

J. K. Lasser's Your Income Tax
Simon & Schuster Software
1 Gulf + Western Plaza
New York, NY 10023
212/378-8142
List price: $75, annual upgrade $30, California and New York modules $39.95 each
Requirements: 512K, two disk drives, DOS 3.0 or later version
Reader service no. 603

Personal Tax Filer
Disk-Count Software
1751 West Country Rd. #107
St. Paul, MN 55113
612/633-2300
List price: $19.95
Requirements: 256K, two disk drives, DOS 2.0 or later version
Reader service no. 604

Swiftax
Timeworks Inc.
444 Lake Cook Rd.
Deerfield, IL 60015
312/948-9200
List price: $69.95, annual upgrade $34.97
Requirements: 512K, two disk drives, DOS 2.0 or later version
Reader service no. 605

The Tax Advantage
Double Eagle Software
2340 Plaza Del Ama #215
Torrance, CA 90501
213/212-6611
List price: $59.95, annual upgrade $39.95, California module $45.05
Requirements: 512K, two disk drives, DOS 2.0 or later version
Reader service no. 606

Tax Preparer
HowordSoft
P.O. Box 8432
La Jolla, CA 92038
619/454-0121
List price: $295, annual upgrade $95, California module $125
Requirements: 128K with IBM BASIC (192K for other versions of BASIC), two disk drives, DOS 1.1 or later version
Reader service no. 607

TaxView
SoftView Inc.
4820 Adohr Ln., Ste. F
Camarilla, CA 93010
805/388-2626
List price: $119, annual upgrade $55, California and New York modules $65 each, TaxView Planner $119
Requirements: 512K, two disk drives, Windows 2.03 or later version (run-time version included)
Reader service no. 608

TurboTax
ChipSoft Inc.
5045 Shoreham Pl.
San Diego, CA 92122
619/543-8722
List price: $75, annual upgrade $37.50
Requirements: 256K, two disk drives, DOS 2.0 or later version
Reader service no. 609

SPREADSHEET TEMPLATES

EasyTax
Valley Management Consultants
3939 Bradford Rd.
Huntingdon Valley, PA 19006
215/947-4610
List price: $89, annual upgrade $35, New York and California modules $49 each, New Jersey and Pennsylvania modules $35 each
Requirements: 384K; two disk drives; 1-2-3, VP-Planner, VP-Planner Plus, or Twin
Reader service no. 610

Executive Federal Tax Template
Tax: Help!
P.O. Box 324
Central Park Station
Buffalo, NY 14215
716/631-3370
List price: $14.95, annual upgrade $14.95, California and New York modules $10 each
Requirements: 640K; two disk drives; 1-2-3 release 1A or later version, Symphony, or Quattro
Reader service no. 611

EZTax-Prep 1040
EZWare Corp.
29 Bala Ave. #206
Bala Cynwyd, PA 19004
800/543-1040, 215/667-4064
List price: $129.95; annual upgrade $77.97; California, New York, and Pennsylvania modules $69 each; EZTax-Plan $95
Requirements: 512K, two disk drives, 1-2-3 release 2.0 or 2.01
Reader service no. 612

Tax Ease
Park Technologies
P.O. Box 1317
Clifton Park, NY 12065
518/877-5881
List price: federal package $99; combination federal/state package $119, annual upgrade $59, Tax Planner $79
Requirements: 512K; two disk drives; 1-2-3, Symphony, VP-Planner, VP-Planner Plus, Quattro, or Twin
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For more information about any product, contact the manufacturer or circle the number on the reader service card.

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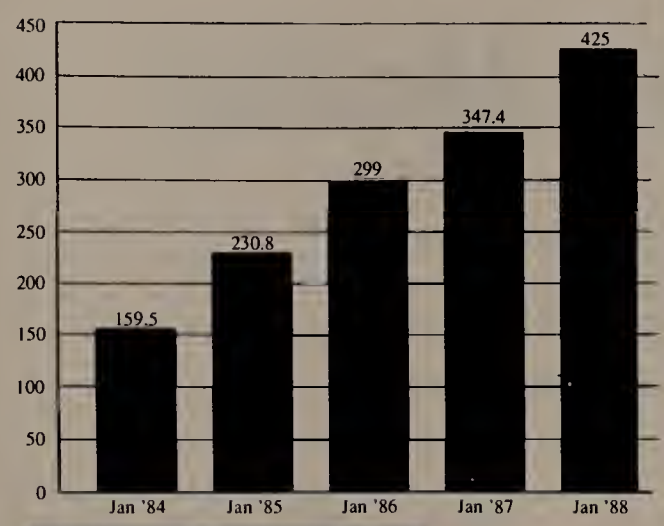

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Secrets From the Framework Master

The whiz kid who developed Framework shares his favorite speed tips and productivity secrets.

Here's how to create a free-format text data base and consolidate a group of worksheets.

Robert Carr

When I created *Framework*, one of my goals was to develop an integrated package with plenty of power. In this article, I'll present some of my favorite techniques for harnessing *Framework III*'s built-in muscle. For example, with a little ingenuity, you can use the footnote function for group editing, create your own personal information manager, or prioritize to-do lists with the outline function.

For users who just want to speed up what they already do, I'll illustrate some lesser-known but useful acceleration techniques. Finally, spreadsheet users will find helpful information on consolidating worksheets.

Accelerate!

Virtually all *Framework* cursor commands can be used with the <Ctrl> key to boost performance. <Ctrl>-<Cursor Left>, for example, moves you one column to the left in a spreadsheet; <Ctrl>-<Cursor Right> jumps forward word by word in text; <Ctrl>-<Cursor Down> moves to the next heading of the same level in an outline. See **FIGURE 1** for a complete list of <Ctrl>-*key* accelerators.

In a spreadsheet, the <Ctrl>-*cursor key* combinations seek out the "edges" of blocks of cells. If the cursor is at the top left corner of a block of cells, select the entire block as follows:

1. Press **<F6>** (Extend Select).
2. Press **<Ctrl>-<Cursor Right>** to stretch the selection to the right edge of the block.
3. Press **<Ctrl>-<Cursor Down>** to stretch the selection to the bottom edge of the block.

You can also use <Ctrl> and a number key to make *Frame-*

work perform an operation as many times as you specify. To move to the 35th line in a word frame, for example:

1. Press **<Ctrl>-<Home>** to get to the top line of the frame.
2. Press **<Ctrl>-3<Ctrl>-5** (use the number keys above the QWERTY keys; the numeric keypad keys will not work).
3. Press **<Cursor Down>**.

Pressing <Ctrl>-3<Ctrl>-5 instructs *Framework* to repeat the subsequent action 35 times, in this case to move the cursor down 35 times.

In similar fashion, here's a speedy way to type a line of 60 *X*'s:

1. Press **<Ctrl>-6<Ctrl>-0.**
2. Press **X.**

Finally, here's how to expand a spreadsheet column by 16 spaces:

1. Press **<F4>** (Size).
2. Press **<Ctrl>-1<Ctrl>-6.**
3. Press **<Cursor Right>**.
4. Press **<Enter>**.

Pause for Comment

Framework's footnote function is useful for much more than just citing references in a term paper. You can use this function as an efficient on-line markup and commenting system for an individual or an entire group.

First, here's a reminder of how to create a footnote:

1. Navigate to the spot in a word frame where you want a footnote marker.
2. Open the Edit menu and choose *Footnotes*.
3. Choose the Create menu's *Note* command, type the contents of your footnote at the prompt at the bottom of the screen, and press **<Enter>** when finished. Use **<F9>** (Zoom) to edit your footnote on a full screen.

Key	Action in word frame	Action in spreadsheet frame
<Ctrl>-<Cursor Up>	Up one sentence	To top of column
<Ctrl>-<Cursor Down>	Down one sentence	To bottom of column
<Ctrl>-<Cursor Left>	Left one word	Left to first column in region
<Ctrl>-<Cursor Right>	Right one word	Right to last column in region
<Ctrl>-<Home>	To first character in frame	To top left cell
<Ctrl>-<End>	To last character in frame	To bottom right cell
<Ctrl>-<Page Up>	Up one paragraph	To top of column
<Ctrl>-<Page Down>	Down one paragraph	To bottom of column

FIGURE 1: Use a <Ctrl>-key combination when you want to move farther or faster.

Here's how to turn your footnotes into comments that can be identified by author:

1. Open the Edit menu and then the *Footnotes* submenu.
2. Choose the *Marker for Note* command and type **Susan 1** (or your own name followed by 1). Press **<Enter>**.

The first footnote will be identified in superscript as 'Susan 1', the second as 'Susan 2', and so on. This tool is especially useful for group editing because each commenter can create attributed footnotes. Insert the date, and you have a sophisticated tracking system.

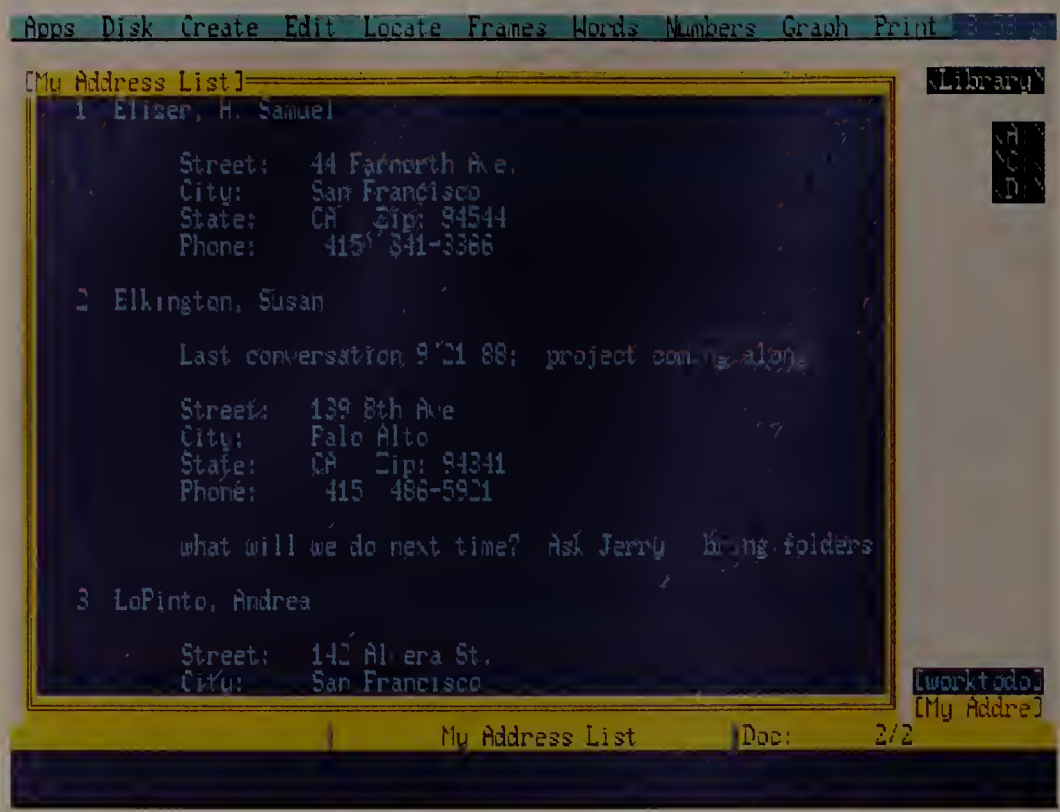
Setting Your Priorities

Most *Framework* users are familiar with the Ascending/Descending Sort commands in the Locate menu for sorting a *Framework* data base or spreadsheet. But the Sort command also works in other places, including outlines. It's especially useful if you want to use the outline function as a personal project management system. All you have to do is type the items on your schedule into the outline, assign each item a priority level, and sort the schedule to view your priorities.

1. Use the Create menu's *Outline* command to set up an outline frame.
2. Type in all the steps required to accomplish a given project, in any order you wish.
3. Prioritize each item at any level by placing a number from 1 to 3 as the first text element in its heading. To do so, position the cursor on the heading and press **<Space>**, type the priority number, and press **<Enter>**.

Once you've prioritized all the headings, you can then sort your to-do list by priority:

1. Make sure your cursor is posi-



SCREEN 1: You can actually use Framework III as a free-format text data base by employing the outline function. Note the free mixing in this example of notes and data base "fields."

tioned on a heading at the heading level you want to sort.

2. Open the Locate menu, and choose the Ascending or Descending Sort.

3. Press <**Enter**>.

If you use higher numbers for higher priorities (for example, 3 for the highest priority), then use the Descending Sort command. Any headings that don't have an assigned priority will sort to the bottom of the outline. If blank headings occur anywhere in the outline, they will rise to the top.

When you've completed an item on your schedule, you can edit it so it appears at the bottom of the outline the next time you perform a sort:

1. Position the cursor on the heading.

2. Press <**Space**> to edit it; next hold down <**Alt**> and then press **4** on the numeric keypad; then press <**Enter**>. During the next sort, the heading will fall to the end of the list.

Free-Format Text Data Bases

Framework III's outline function supports multiple-line headings, which provide lots of room for text. Combine this feature with the new wild-card search capability, and the power of a free-format text data base is at your beck and call.

The steps involve creating outline headings that serve as "records," then placing any amount of text or "fields" into a record. Here's how to create a very simple Rolodex-style data base (see **SCREEN 1**):

1. Open the Create menu and choose *Empty/Word Frame.*

2. Press <**GrayPlus**> (In), and then create a subframe by repeating the first step.

3. Press <**F10**> (View) to switch to outline view.

4. Press <**Space**> <**F9**> (Zoom) and <**Enter**>. Then type the following field names, pressing <**Enter**> after each one: **Street: City: State: Phone:**.

5. Press <**F9**> (Zoom), then press <**Enter**>.

You now have one blank "record" that contains address and phone fields. The first line is blank since you'll be using it for the name field. Now create multiple records by copying the blank one:

1. Press <**F8**> (Copy), then <**Enter**>.

2. Repeat the first step until you have enough copies.

3. Press <**Home**> to return to the first record.

Now, to fill out the first record:

1. Press <**Space**> to edit the heading.

2. Type the name of the contact.

3. Use the cursor keys to move to the right of the other fields, then enter the appropriate values there—address, city, state, and so on.

Note that all this information is stored in the outline header, which is the same as the frame title. If you press <F10> to go to frame view, you'll see only the first line of each record, but the entire capacity of the frame will still be available. You can place more text and notes inside the frames behind each heading, or store many subframes—all correspondence exchanged with a client, for instance, or spreadsheets with the client's billing history.

Use the Locate menu's Search command to find records in a jiffy. If you want to search on names, make sure you select the Labels On option first. To restrict your search, say, to just the state field so that a search for 'CA' won't match the first two characters of 'cantaloupe', use *Framework III*'s advanced wild cards. These special characters go far beyond the DOS ? and * wild cards and are documented in appendix C of the manual.

To search for the state field:

1. Press **< Gray Minus >** (OUT) to make sure you are searching from the outer border of the frame containing the Rolodex.
2. Open the Locate menu, move the cursor to the 'Contents Included' command, and press **< Delete >** to turn that option off. Move the cursor to the 'Notes Included' and 'Formulas Included' options and press **< Delete >** there, too.
3. Move the cursor to the 'Labels Included' option, and press **< Ctrl > - < Enter >** to turn that option on.
4. Type **S** to begin the search, then type the search argument **State:\ + CA** and press **< Enter >**.

The \ indicates that the next character is a control character; the control character + tells the program to search for the following characters, in this case, spaces. So the search target will match any outline headings that contain the text 'State:' followed by zero or more spaces and then the string 'CA'.

Interworksheet Consolidation

Any *Framework* cell can have a formula that refers to other cells in the same worksheet or to other frames on the desktop. For instance, to write a formula including a reference to a frame in your library called Interest (that contains the current interest rate), use the name Interest in a formula just as you would use a cell name such as C2 or D14.
1. Create an empty frame and name it **Interest**.
2. Select the border of the frame, using **< Gray Minus >**.
3. Press **< F2 >** (Edit Formula), then enter the interest rate and press **< Esc >**.
Now you can use the interest rate in a formula by referring to the name of the frame.

To refer to a cell *inside* another worksheet, join the worksheet's name to the cell's, with a period between them. If you're in a fourth-quarter budget worksheet named Q4 and you want to point to cell D14 in a worksheet named Q3, simply enter Q3.D14.

Consolidating entire worksheets is a straightforward task: Write the consolidation formula once, then copy that cell to as many cells as necessary (see **SCREEN 2**). To create such a system of multiple spreadsheets, say, four quarters of detailed budgets and an annual roll up:
1. Create a budget worksheet as a template and name it **Q1**.
2. Select the border of Q1's frame, using **< Gray Minus >**; press **< F8 >** (Copy) and then **< Enter >**. Repeat the process two more times, and then name the new sheets **Q2**, **Q3**, and **Q4**.
3. Make another copy and name it **1989**.
4. In cell B2 of worksheet 1989, type the formula **Q1.B2 + Q2.B2 + Q3.B2 + Q4.B2** and press **< Enter >**.
5. With cell B2 in worksheet 1989 highlighted, press **< F8 >** (Copy), press **< F6 >** (Extend Select), press **< Cursor Right >** and **< Cursor Down >** several times, and then press **< Enter >** twice.
This copies cell B2's formula out into a larger block. In your real worksheets, you should extend the destination of the copy as far to the right and as far down as you want rows and columns consolidated.

SCREEN 2: To consolidate a group of worksheets, simply type in a consolidation formula, as shown above, that refers to the relevant worksheets and cells. Then copy the consolidation formula to as many cells as required.

But Don't Stop Now

The tips presented in this article can help you speed up *Framework III* or create applications that boost productivity. For further user-oriented tips, one resource is the Boston Computer Society, which operates a special interest group for *Framework* users. You can reach BCS at 617/367-8080. ●

Robert Carr is the creator of Framework *and a founder of Go Corporation in San Francisco.*

TIPS & TECHNIQUES

Communications

Cut Costs on CompuServe

Save dollars and time with some tricks culled by an on-line master.

What you need: modem, communications package, CompuServe account

Once you're in the groove with an on-line service like CompuServe, it's easy to lose sight of faster—and therefore cheaper—ways of doing things. But money-saving shortcuts abound. Assembled here are some obvious and not-so-obvious tips that can help old hands and novices alike get the most out of CompuServe.

Use CompuServe's Packet-Switching Network

CompuServe charges a mere 30 cents an hour for access through one of its own network nodes—a lot cheaper than Telenet or Tymnet access. And CompuServe is adding local network nodes all the time.

New node access numbers are almost always announced on the TOP or What's New greeting menus. Unfortunately, few users pause to read these menus. Moreover, most automate their sessions with script files, keyboard macros, and the like, so that the greeting menus are just a blur on the way to a forum, EasyPlex, CB Simulator, or some other favorite CompuServe feature.

Take time to stop and smell the bargains. Every couple of months, type GO PHONES to scan the current list of access numbers for your area code. Even if the nearest node is a toll call, it still pays to check with your long-distance carrier for the day, evening, and night rates for that number. Be sure to ask about any state and federal taxes that may apply. You may find that dialing a distant CompuServe node is cheaper than making a local call via Telenet or Tymnet.

Optimize Your CompuServe Profile

If you haven't done so recently, type GO TERMINAL and select Change Permanent Settings. You can eliminate paging pauses and the nuisance of having to hit <Enter> or S to scroll after every 32 lines of text are displayed. Merely set Paged Display under Display Options to No, then set the Lines Per Page option on the Terminal Type/Parameters menu to zero. On the same menu, set the 'Micro Inquiry Sequence at Logon' feature to No, to prevent the system from interrogating your terminal each time you sign on, and set Output Delays to zero unless you plan to print hard copy while on line.

Under Logon/Service Actions, change the EasyPlex Waiting default to the Go To EasyPlex setting. This saves you the trouble of typing GO MAIL when you have mail waiting. Finally, in the Transfer Protocols/Graphics Support menu, set Protocol Preference to the error correction protocol you normally use when downloading a forum. This suppresses the protocol selection menu that otherwise appears when you start to download a file.

Don't Search for Software On Line

For obvious reasons, it is almost always best to do as much work as possible off line. So instead of searching through one of the IBMNET forums for a public domain or shareware program, go to your forum of choice and type DL0 to enter the forum's New Uploads data library. You'll find a compressed ASCII file there that lists file names and brief descriptions of the programs in all of that forum's libraries. Download the file, and decompress and search it at your leisure.

CompuServe SYSOPs prepare these summary files monthly for each IBMNET forum, and the word SUM always appears in the file name. Thus, SYSSUM.ARC

is the summary file for all libraries in the Systems & Utilities Forum, PROSUM.ARC is a summary of all Programming Forum libraries, and so on.

You can update your summary files regularly by downloading update files that the SYSOPs place in DL0 each month and merging them with your summaries. These files always contain the letters CHG, as in SYSCHG.NOV, PROCHG.DEC, and so on.

Don't Use XMODEM

The XMODEM protocol was written for PC-to-PC communications and can be slow when linked to CompuServe's mainframe. Use the CompuServe B or Quick B protocol instead. If your current communications program doesn't support these protocols, switch to a program that does, like *ProComm 2.42* or *ProComm Plus*, or get Steve Sneed's OZBEXT external protocol module, which lets virtually any communications program use the B protocol. You will find the file in the IBMCOM Forum in DL10 as OZBEXT.ARC.

Choose the Right Modem

Is a 2400-bps modem more economical than a 1200-bps modem? That depends on how much downloading you do and how much you pay for connect time. At current CompuServe rates, you would have to download over 9MB of data to break even on a 2400-bps modem purchase. To calculate the costs on your own, remember that 10 bits are required to transmit 1 byte. Thus a 2400-bps modem can transmit 240 bytes per second; a 1200-bps unit, 120 bytes per second.

Download After Midnight

Downloading is much slower between 10 p.m. and midnight (Eastern time) because the entire country seems to be on line during those hours. CompuServe's low-cost evening rate goes into effect at 7 p.m. in each time zone, so that by 10 p.m. Eastern time the evening rate applies to everyone from Malibu to Brookline. Wait until midnight Eastern time when the East Coast goes to bed, and CompuServe will speed up again.

Use Quick Words

It is much faster—and therefore cheaper—to use a "quick word" than to wend your way through the CompuServe menus that lead to the same spot. For example, to get to the IBM Applications Forum, just type GO IBMAPP. You can periodically download an updated copy of the system's index of page names and quick words by typing GO IND and selecting the List All Indexed Topics option.

Invest in CompuServe's Executive Option

If you're a businessperson or if you constantly manage investments, CompuServe's Executive Option is a great deal. Sign up, and you get 50 percent more storage space in your Personal Filing Area; six month's free storage (versus the standard one month); a 10 percent discount on most CompuServe products; volume discounts on stock quotes; and access to data bases like Ticker Retrieval, Disclosure II, and Securities Screening, to mention a few.

The one-time sign-up fee of $10 is usually waived for new CompuServe subscribers; the minimum monthly charge is $10.

Assuming a connect charge of 22 cents per minute, you'll easily spend $10 per month just checking your mail four times a week.

Automate Communications

You can instruct EasyPlex to display all waiting letters immediately by typing RECEIVE at the main menu prompt. When you're finished, type DELETE to remove the letters from your mailbox. To save time sending letters, embed TO:, FROM:, and SUBJECT: in letters prepared off line. These identifiers can appear in any order as long as they occupy the first three lines of the text. Put /EX or /SEND alone at the far left margin of the last line of the letter for hands-on posting.

Finally, if you're active in the forums, you should definitely be using *AutoSIG*, *TAPCIS*, *ZAPCIS*, or a similar program that automatically logs on to CompuServe and searches for and

MAX SEABAUGH

downloads all messages addressed to you. You can then type in replies off line and tell the program to sign on again and upload them. Check the IBMCOM forum (GO IBMCOM) for more information on where to find these programs and how to use them.

These are just a few tricks that can save you costly connect time on CompuServe. Many more await your discovery. The key is climbing out of your rut every now and then and looking around. Often, you can take what you find to the bank.
—*Alfred Glossbrenner*

Q&A Message Center

Here's a painless way to automate phone messages.

What you need: Q&A 3.0

If you spend a lot of time working in *Q&A*, the phone-message macro described in this article will probably come in handy. You can create a macro that prompts the user to fill in the blanks in a date- and time-stamped phone message form. The macro then prints the form, clears it from memory, and returns you to *Q&A*'s main menu.

You can use the macro from anywhere within *Q&A*, and you can easily adapt it for notes, memos, or other office reminders. If you work in certain areas of *Q&A* more than others (such as entering File data), you can also set up the macro to return you to where you work most often.

Creating the Message Form

Before you begin creating the message form, note that the directions in this article assume you've installed *Q&A* for single-key command response, meaning that in many cases you don't have to press <Enter>. To activate this option, press U for Utilities from the main menu and S to Set global defaults; then use the cursor keys to highlight 'Automatic Execution', and press Y. Next press <F10> and <Esc> to return to the main menu.

Now you can create the message form. Choose *Write* from the main menu, and then select *Type/Edit*. Type in the information shown in **SCREEN 1**, which includes fields for the date, time, sender's name, message recipient, and so forth.

In **SCREEN 1**'s sample message form, the *@DATE(11)* and *@TIME(1)* codes tell *Q&A* to insert the current date and time in the following formats: October 18, 1988; 3:20 p.m. But if you'd prefer a different style, note that *Q&A* offers 20 date and 3 time formats, listed on page W-92 of the manual.

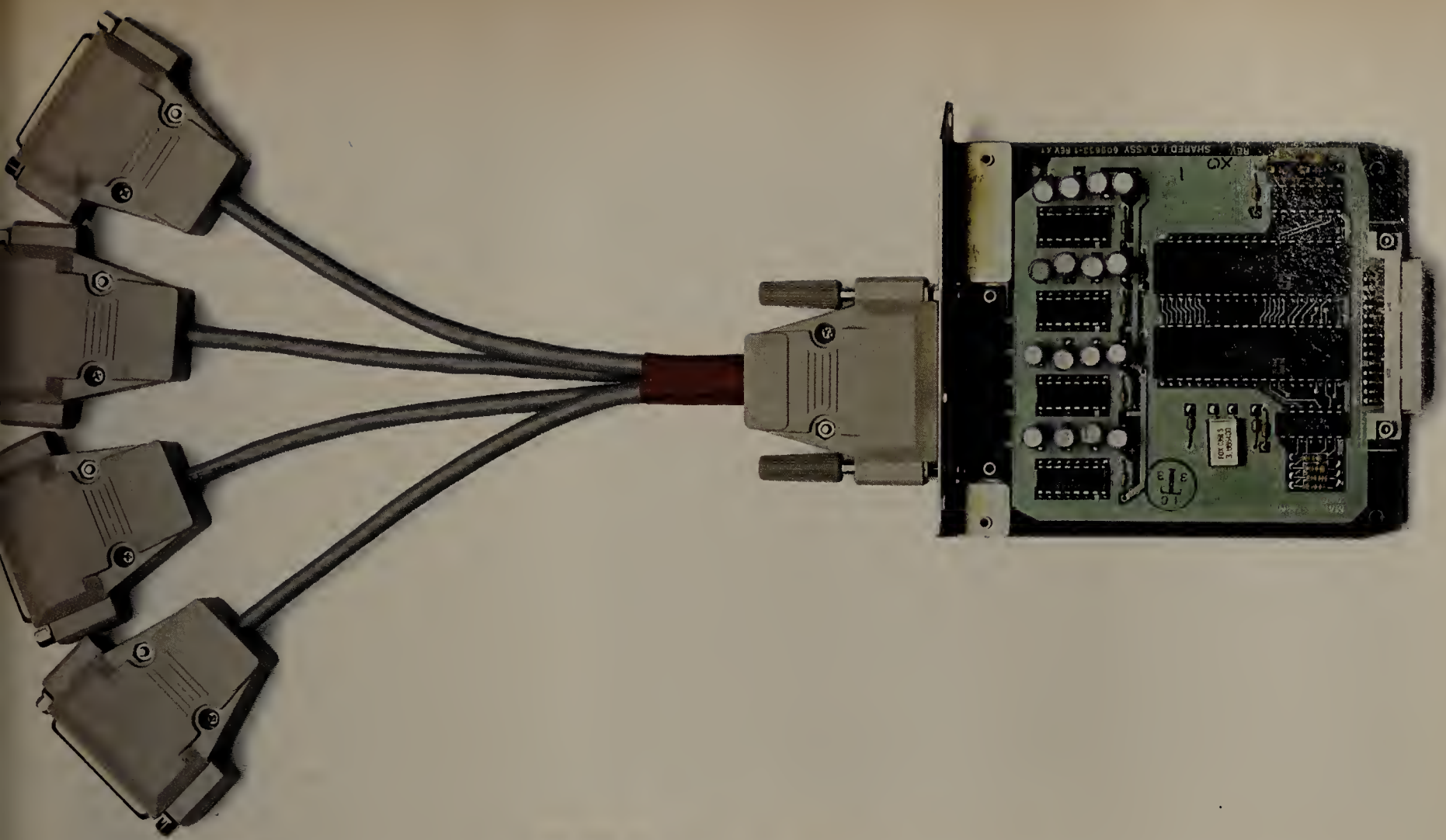
For effect, you can also use Write's text enhancements, including boldface, line draw, and PostScript fonts. To format the word MESSAGE as shown on **SCREEN 1**, for example, begin by positioning the cursor at the beginning of the word. Then, to boldface the word, press **<Shift>-<F6>**, type **B** for Bold, mark the word with the cursor keys, and press **<F10>** when finished. Next, to center MESSAGE, press **<F8>** and then **C**. Finally, to surround the word with a box, move the cursor down one line, then press **<F8>** and **D**, and use the cursor keys to draw the box; then press **<F10>** when you're done.

When the form is formatted to your satisfaction, use **<Shift>-<F8>** to save it to a file named **message.frm**, and press **<Enter>**.

Creating the Macro

To set up the macro, begin at *Q&A*'s main menu. Press **<Shift>-<F2>** to display the Macro menu, then press **D** to choose Define Macro. *Q&A* asks for a 'macro identifier', the keystrokes that play back the recorded macro. Most characters can be used as identifiers, alone or with <Ctrl> or <Alt>; for this example press **<Alt>-M** for Message. (A flashing square in the screen's lower right reminds you that macro recording is turned on. Everything you type, including command keystrokes, will be recorded until you press <Shift>-<F2> again to turn recording off.)

Next, press **<Esc>** six times, so that if you use the macro from some other point in *Q&A*, you'll be sure to return to the main menu first. Then press **W** to start Write, and then **G** to Get a document file. At the prompt, type **message.frm** and press **<Enter>**. Caution: If message.frm was the last file you worked on, it will appear at the prompt as the suggested file, but *don't* just press <Enter>. You



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SCREEN 1: Type in the information as shown to create a handy phone message macro for Q&A 3.0.

must actually type in the name of the file, or the macro won't work properly.

When the form appears in the edit screen, the cursor will be positioned wherever it was the last time you saved the file. Press **<Home>** three times to move the cursor to the top of the file. Then press **<Ctrl>-X** until the cursor is on the line containing the 'To:' prompt. (You could also press <Cursor Down> or use Search to position the cursor; all the methods work equally well.) Next press **<End>** and then **<Space>** **<Space>** to position the cursor right in front of the 'To:' prompt.

When you actually use the macro, you'll want it to pause at this point while you enter the message recipient's name. Press **<Alt>-<F2>** to insert a variable-length pause. The cursor changes to a flashing square, and *Q&A* displays the message: 'Enter variable text. Press Alt-F2 to resume saving into macro.'

Press **<Alt>-<F2>** again to end the pause. When you play back the macro, it'll pause and display a message reading: 'Enter text. Press ↵ to resume macro playback.' Word wrap will be operational, so you can type multiple lines of text. You'll also be able to use the cursor keys to enter and edit text above and below the current position; but when you press <Enter>, the cursor will advance to the next text field.

Next, you'll use the Search function to move the cursor to the next message field ('Re:'). (Don't use the cursor keys here instead of Search.) Press **<F7>** (Search), type **Re:** as the search string, and press **<F10>** to continue. *Q&A* highlights 'Re:' and tells you to press <Enter> to search again or <Esc> to resume editing. Press **<Esc>**; then position the cursor for text entry in the 'Re:' field, and create another pause by pressing **<Alt>-<F2>** twice.

Press **<F7>** to start the Search function again, and type **Message:** as the search string. Press **<F10>** to perform the search, press **<Esc>** to continue editing, and position the cursor after the 'Message:' prompt. Remember to create a pause for this last field by pressing **<Alt>-<F2>** twice; otherwise, when you use the macro, *Q&A* will print the form immediately instead of waiting for you to type a message.

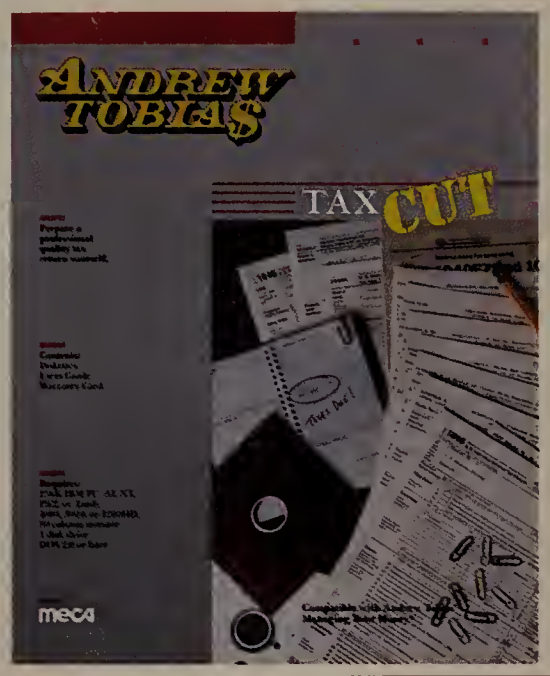
Next, use the cursor keys to move to the line that says 'Make sure the printer is on!' You won't want to print this reminder. Press **<Alt>-<F2>** to tell *Q&A* to pause before erasing the message. (When you use the macro, you'll see the now-familiar prompt that says 'Press ↵ to resume macro playback.') Press **<Alt>-<F2>** to end the pause, then press **<Ctrl>-E** to move the cursor to the first line of the message and **<Ctrl>-Y** twice to erase both lines.

Next, press **<F2>** to print. At the Print Options screen, enter any special settings for phone messages (you may wish to set 'number of copies' to 2, for example). You could also insert another pause by pressing <Alt>-<F2> twice to allow the user to customize the settings each time a phone message is printed. Press **<F10>** to send the completed form to the printer.

After the form prints, press **<Esc>** to return to the Write menu, then press **C** to clear the form from memory. *Q&A* reminds you that you haven't saved the form document and asks whether you want to continue anyway. Press **Y**, then press **<Esc>** twice to return to the

WHAT YOUR ACCOUNTANT MIGHT NOT WANT YOU TO KNOW*

*Andrew Tobias' Tax Cut lets you prepare a professional quality tax return yourself – even if you're a novice at tax preparation.



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Tax Cut automatically calculates and prints your completed 1040 return and up to 23 other IRS-approved forms and schedules. It finds the tax approach that saves you the most money: whether you should file jointly, itemize, take the zero bracket amount, and much more. It features an instant tax summary window that lets you see where you stand at any point in the program, and "What if" calculations on any form or schedule for important planning before year-end.

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main menu. Finally, press <Shift> - <F2> to turn macro recording off and then <Enter> to save the macro to the default file name, qamacro.asc.

If you spend most of your time working in File or Intelligent Assistant, you can include keystrokes that return you from the main menu to your previous position. When you create the macro, add the necessary keystrokes right after the form prints.

If you make a mistake while recording the macro, you needn't repeat every step, because *Q&A* lets you edit macros. Simply select Write from the main menu, press G for Get file, type qamacro.asc and then A for ASCII. The text of the macro will appear on screen, and you can edit it using the directions on page M-23 of your manual. To save the file after editing, press <Ctrl> - <F8>. — *George Beinhorn*

Hard Disks

How to Prevent Hard Disk Disaster

Heed a hardware pro's Rx for keeping your drive fit.

What you need: a hard disk and hard disk utilities

Hard disk malfunctions are like death and taxes, so it's better to be prepared than surprised. The sooner you realize your hard disk is about to falter, the better your chances of keeping a minor breakdown from escalating into a full-fledged disaster.

The best protection against hard disk disaster is to back up frequently, preferably at the end of each day. A tape drive, a Bernoulli Box, or a second hard disk can make regular backup nearly effortless, but anyone with a copy of DOS's BACKUP.COM utility can do the job using floppy disks. If you're incorrigibly lazy or forgetful, you can put the backup command into the system's AUTOEXEC.BAT file, so that your system automatically backs itself up whenever you turn it on.

Hard disk hazards range from vibration to power surges to the ravages of age. Fortunately, most hard disks don't just suddenly crash; the symptoms of impending doom generally appear well in advance. Most ailments are preventable, with the help of specialized hard disk utilities such as *Mace Utilities*, *hTEST/hFORMAT*, *The Norton Utilities*, *PC Tools*, *SpinRite*, and *Disk Technician*. If you heed the warning signs and take appropriate actions, you can often minimize inconvenience and prevent data loss.

Use CHKDSK Regularly

Ever wonder why your hard disk seems to hold less than it used to? Or why the end of your monthly progress report is suddenly tacked on to your report on wheat rust futures? Chances are your hard disk is a victim of lost clusters or cross-linked files. Although these problems have different roots, CHKDSK is the common key to their resolution.

A cluster is lost when the file allocation table (FAT) records it as being in use but it's not claimed by a file. Clusters typically go wandering when the PC loses power while data is being written to the disk or when you turn off the PC without exiting a program properly. Lost clusters won't damage the hard disk, but over time they can soak up disk acreage.

You can identify lost clusters by running DOS's CHKDSK utility. To reclaim the clusters, run CHKDSK with the /F (Fix) parameter. CHKDSK/F will pull the lost clusters into sequentially numbered files starting with FILE0000.CHK, and save them in the root directory. Open these files and you may discover parts of documents you didn't save properly, bits of deleted files, or fragments of program files. You can't do much with the latter, but the other data can be examined, deleted, or saved for further use.

However, if two files try to claim the same cluster or chain of clusters—that is, if they are cross-linked—a great deal of data may be corrupted. Run CHKDSK to find the files locked in this deadly embrace; to untangle them, copy the files to different file names and then delete the originals. You may be able to salvage documents and other ASCII files from the wreck, but *don't* use cross-linked .EXE and .COM files; reinstall them from the master floppy disks.

Avoid Temperature Extremes

Because a hard disk's read/write heads operate within tolerances measured in millionths of an inch, it's not surprising that even small environmental changes can wreak havoc. For example, boot up a PC that's been left in a

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freezing draft or in the summer sun, and you may be greeted by 'invalid drive specification' or 'invalid partition table' error messages. The reason: The platter has shrunk or expanded to the point that the read/write heads can't find the master boot record. The solution: Turn the system off, take it out of the cellar (or the sauna), give it an hour or two to get reacquainted with normal operating temperatures, and restart it.

Check Those Headers

Day-to-day mechanical wear can cause a hard disk to write data sectors out of alignment with sector ID headers. (Sector ID headers are written only once, during a low-level format; data sectors are rewritten every time data is saved.) As a hard disk ages, misalignment can worsen until a data sector can no longer be found. Worse, data can be written to a bad sector and lost forever.

You can minimize sector drift by periodically running disk utilities that realign the sectors with their ID headers. This is a simple one-command process with *The Norton Utilities* and *hTEST/hFORMAT*, and a somewhat more complicated matter with *SpinRite*. *Disk Technician* realigns sectors automatically every time you run it.

Park Those Heads!

Parking a hard disk's read/write heads is de rigueur whenever you move a PC. Bump into a desk or (horrors!) drop the system, and the drive's heads can fatally scar the platter.

That much is obvious. But you'll also find that parking the heads routinely can prevent more subtle but equally malicious problems.

For example, over a period of years, the unique magnetic signature of sector ID headers fades and eventually becomes unreadable. This may not happen during your system's useful lifetime, but the process can be inadvertently hastened if the PC is turned off and the heads (which have some residual magnetism) are left dangling over a header for a long time. The magnetism can also scramble data underneath. If you turn on a computer whose drive heads were left unparked, data may be corrupted because the heads will move slightly sideways as the disk comes up to speed.

The best prevention? Park the drive's heads before shutting off the system or if the system will be inactive for more than a few hours. Newer drives park their heads automatically or at least come with a parking utility. If your drive hails from an earlier era, use a head-parking utility of the type included in the *Mace*, *Norton*, *SpinRite*, and *PC Tools* packages. *Disk Technician* even features a RAM-resident utility that parks the heads automatically if the drive is inactive for any time period you specify.

Hard Disk Doom: Sector Misalignment

As your hard disk ages, data sectors can gradually drift away from accompanying ID headers, jeopardizing file integrity.

Identify Bad Sectors

Any disaster-prevention regime should include regular testing of every sector's integrity. You might be tempted to put this job off, since DOS is adept at wresting data from even the ugliest disks. Don't. If DOS's 'Abort, Retry, Ignore?' message starts popping up, it could mean a good sector is about to go bad.

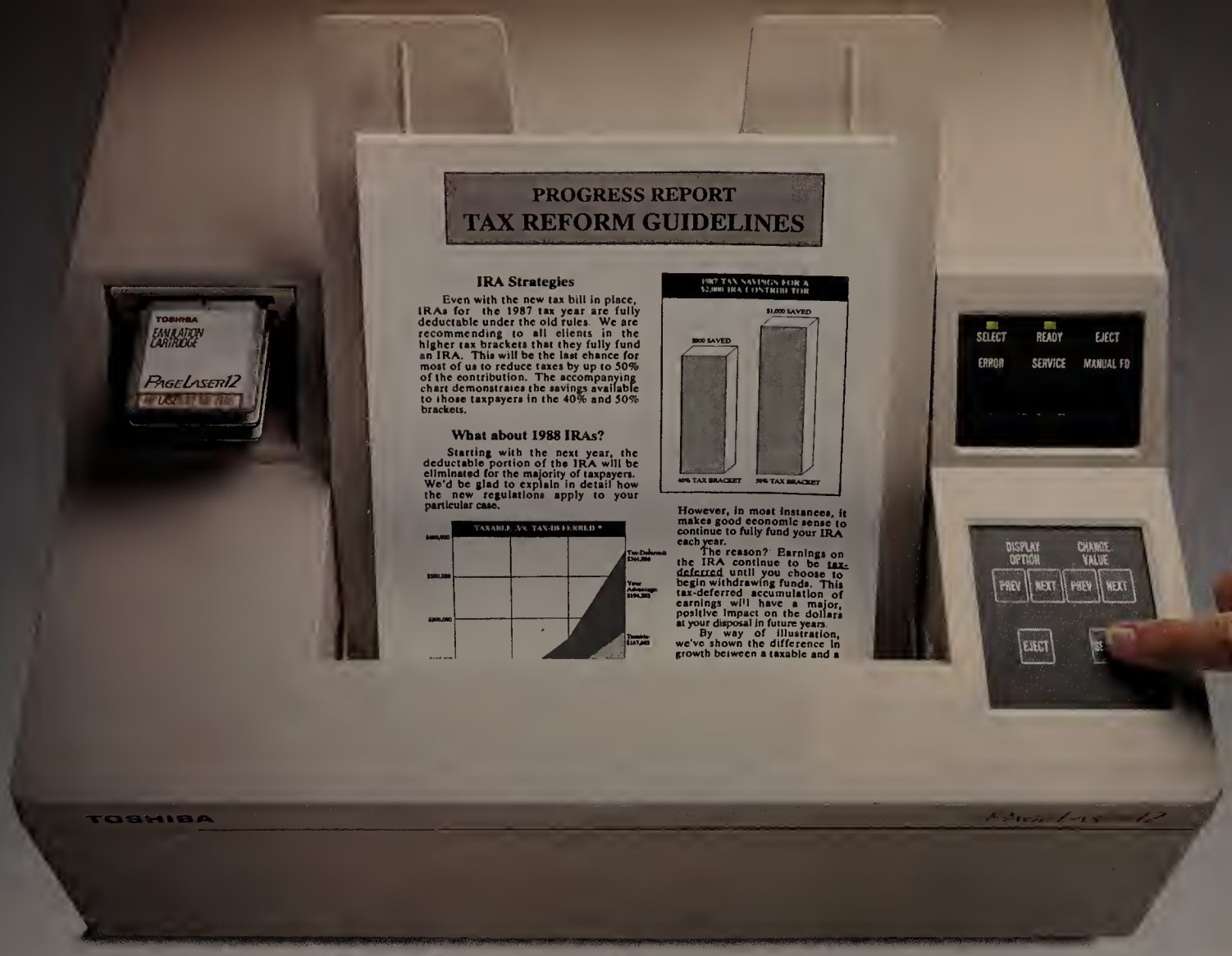
If sector drift is the culprit, the steps outlined under "Check Those Headers" should restore your data. But if that doesn't fix your problem, it may mean your hard disk's coating is deteriorating; in that case, all you can do is cordon off the bad sector. Diagnostic utilities from *Mace*, *Norton*, *SpinRite*, and *PC Tools* quickly pinpoint a questionable sector, transfer data to a sound one, and lock out the bad sector permanently.

As in all things PC, regular maintenance is key. Get a capable disk utility, use it consistently, and your hard disk will have a better chance at leading a long, happy, and productive life.
—*Lewis Perdue*

FOR MORE INFORMATION

Disk Technician
Prime Solutions, Inc.
1940 Garnet Ave.
San Diego, CA 92109
619/274-5000
Reader service no. 640

hTEST/hFORMAT
Paul Mace Software, Inc.
400 Williamson Way
Ashland, OR 97520



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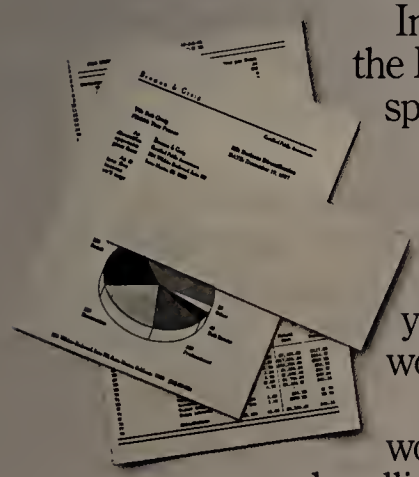

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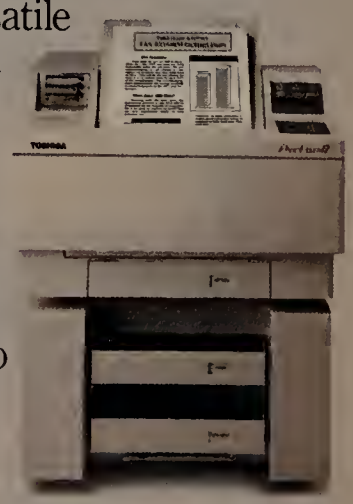

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Paul Mace Software, Inc.
Reader service no. 642

The Norton Utilities
Peter Norton Computing
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Santa Monica, CA 90403
213/319-2000
Reader service no. 643

PC Tools
Central Point Software Inc.
15220 N.W. Greenbrier Pkwy. #200
Beaverton, OR 97006
503/690-8090
Reader service no. 644

SpinRite
Gibson Research Corp.
22991 La Cadena
Laguna Hills, CA 92653
714/830-2200
Reader service no. 645

Utilities

A Phone Trick for SideKick

This macro makes the switch from COM2 to COM1

What you need: SideKick Plus, SuperKey 1.16A

The paperless office may be a myth, but *SideKick Plus* makes a worthy bid for the paperless phone book. To increase your Phonebook listings, you can swap directories with other *Plus* users and use lists made with *SideKick* or *Traveling SideKick. Plus*, however, uses COM2 as the default serial port setting when it dials phone numbers.

If your modem is set for COM1 and you aren't eager to reconfigure your hardware, you have two options. You can convert imported Phonebook directories manually with *SideKick Plus* (not terribly appealing, since directories can contain more than 200 entries); or you can use a macro processor such as *SuperKey* to create a macro that changes the COM port settings automatically. Here's a simple *SuperKey* macro that does the trick.

FIGURE 1: Here's what SuperKey looks like as it works with SideKick Plus. The COM port macro cycles through the PhoneBook communications menu to switch port settings.

Creating the Macro

First, load *SuperKey;* then load *SideKick Plus*. You must load *SuperKey* first to avoid system crashes.

1. Press **<Ctrl>-<Alt>** to start *SideKick Plus* and display the main menu.

2. Type **P** to open the Phonebook; the last phone directory list you used appears on screen.

3. Press **<F3>**, type the name of the file you want to convert, and press **<Enter>**.

4. Press **<Ctrl>-<Page Up>** to move the cursor to the first directory listing.

Now build the port-switching *SuperKey* macro.

5. Press **<Alt>-=** to begin recording macro keystrokes.

6. *SuperKey* will prompt you to define the keys to start the macro. For this example, press **<Ctrl>-U**.

7. Display the Phonebook main menu by pressing **<F10>**.

8. Open the communication menus by pressing **C**, and type **LS1** to select the COM1 serial port.

9. Use **<Cursor Down>** to highlight the next Phonebook entry.

10. Press **<Ctrl>-U** to repeat the macro.

11. Hold down **<Alt>** and press – (the minus sign) to switch off macro recording.

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You also use *SuperKey* to store the macro in the current directory.

12. Press <Alt>-/ to display *SuperKey*'s main menu; press **M** to open the macro menu (see **FIGURE 1**).

13. Punch **S**, type a file name, and press <Enter> to save the macro in the current directory. *SuperKey* automatically adds a .MAC file extension.

14. Press <Ctrl>-U to run the port-switching macro.

15. When the macro reaches the last entry, press <Ctrl>-<Esc> to stop macro playback. This step is necessary to make *SuperKey* stop the macro when it reaches the end of a directory.

The Macro at Work

Here's what to do the next time you want to convert a phone directory. Load *SuperKey* first, and then load *SideKick Plus*.

1. Press <Ctrl>-<Alt>P to open the Phonebook.

2. Press <F3>, and type the name of the directory you want to convert.

3. Press <Ctrl>-<Page Up> to move the cursor to the top of the directory.

4. Load the port-switching macro with *SuperKey* by pressing <Alt>-/ML and typing the macro file name. (If *SuperKey* replies 'File not found', you probably haven't logged on to the directory containing the macro. Try again; this time, type the full path to the directory with the name of the macro.)

5. Press <Ctrl>=U to run the macro and <Ctrl>=<Esc> to stop it.

Quick Proofing With SuperKey

If the macro malfunctions, *SuperKey*'s macro editor can provide an easy remedy.

1. Display the *SuperKey* main menu by pressing **Alt-/**.

2. Press **MD** to open the macro menu and display the macro editor menu.

3. Press <Ctrl>-U to display the contents of the <Ctrl>-U macro file. If you've recorded the macro correctly, *SuperKey* should display the following keystrokes:
.<F10>cls1<DN><Ctrl>U.

4. You can edit the macro or press <Alt>-<Esc> to exit the macro editor.

This port-switching macro is a handy way to convert imported *SideKick Plus* Phonebook listings containing a mix of COM1 and COM2 entries. When you create new phone lists with *SideKick Plus*, port switching doesn't require a macro. Simply remember to set the first entry to COM1 with the Communications Line Set menu. COM1 will be the default for all the entries in that file, and you won't have to fuss with port conversions again. —*George Beinhorn*

Alfred Glossbrenner is the author of Alfred Glossbrenner's Master Guide to CompuServe *(Brady/Prentice Hall Press, New York, 1987). He can be reached on CompuServe at 70065,745. George Beinhorn is a freelance computer journalist in North San Juan, California. Lewis Perdue is the editor and publisher of* PC Management Letter *and the author of* Supercharging Your PC *(Osborne/McGraw-Hill, Berkeley, California, 1987).* ●

USER GROUP TIPS

Helpful hints from members of the nation's user groups

Screen That Screen

If a monitor displays the same image, say a program's menu, for hours on end, the characters may burn into the phosphorus coating on the inside of the screen and cause permanent damage. The following batch file turns the screen white, allowing you to see any burned-in characters, which will show up gray.

First, make sure the file ANSI.SYS from your DOS disk is in the \DOS directory; then, assuming you have a hard drive C:, add the line DEVICE=C:\DOS\ANSI.SYS to the CONFIG.SYS file. Then type the following at the DOS prompt, pressing <Enter> at the end of each line:

```
copy con burnchk.bat
cls
prompt $e[7m
cls
pause
prompt $e[0m$p$g
cls
cd\
```

Press either <F6> or <Ctrl>-Z followed by <Enter>, to save the file, and then reboot the PC.

To use the file, enter BURNCHK at the DOS prompt. The screen will turn white with a black border. Hit any key to return the display to normal. If burned-in characters are visible, you should install a screen saver

UNINTERRUPTIBLE

Power supply is crucial. The slightest flicker in power can mean lost data, decreased production and hours of reorganization. Lightning strikes result in billions of dollars in equipment damage each year. AC line noise, electromagnetic or radio frequency noise cause irratic system performance and computer screen glitches. In short, there are 3 things you can count on. Power outages, noise interference and the TSI Uninterruptible Power System to solve these problems.

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Circle 245 on reader service card

```
USE datafile
total_records = reccount()
record = 1
. . .
   DO WHILE .NOT. EOF
   . . .
   ** process current record here **
   . . .
   @ 23,00 to 23.79
   @ 23,00 to 23,((record * 80)/total records)-1 double
   SKIP
   record = record + 1
ENDDO
. . .

RETURN


Printing Report . . .
```

SCREEN 1: Here's a simple dBASE program that keeps track of how much processing time your task requires. The double line visually represents how far the program has progressed.

program. This trick has the added advantage of showing whether the screen display is centered.

Scott Whitney
Orange Coast PC User Group

dBASE Time Check

Sometimes it's frustrating when *dBASE III* begins processing a large data base file because you can't tell how long the process will take. Here's a routine to use at the end of a *dBASE III* processing loop to get a visual representation of how far the processing has progressed.

Using the box command **@ 23,00 to 23,79**, you can display a single rule across the width of the screen at line 23 to separate the display from the messages on line 24. To monitor the processing loop's progress, use a second box with the double command to generate a double-lined rule that travels along line 23 and represents the proportion of the data base processed so far.

To achieve this, two variables are required. One stores the total number of records to be processed: total_records = reccount(); the other is a counter that increases incrementally each time a record is processed: record = record + 1. To draw the double line, use the command **@ 23,00 to 23,((record * 80)/total_records)-1 double.**

SCREEN 1 shows the program code as it would appear at the end of the processing code, along with an example of the type of indicator it creates.

Les Siemens
Newsletter Publisher
Tucson Computer Society

The DOS Typewriter

Most people know that COPY CON *filename* is a quick way to write an ASCII file (typically a batch file) to disk. Fewer know that there's also an on-the-fly method for writing to the printer: COPY CON PRN. This command is handy for banging out a short memo or an envelope. To use it, first go to the DOS prompt, type COPY CON PRN, and press **<Enter>**. Now type what you want, a line at a time. If you make a mistake on the current line, you can edit it with the **<Backspace>** key. When you're done with a line, press **<Enter>** to go to the next line. When you're completely finished, press **<F6>** and **<Enter>**, and your text will print out.

If your printer has a large buffer, it may store what you've typed until it has more to print. You can eject the page by holding down **<Alt>** and pressing the numbers 1 and 2 on the numeric keypad before printing.

Hy Bender
Contributing Newsletter Editor
New York PC User Group

Chip in! If you're a member of a user group and have tips to share, send them to PC World. *We pay $25 for each published tip. Or if you have a business problem that requires a PC solution, get in touch with our experts. See How to Contact PC World, page 4.* ●

POWER TIP NO. 34

Revealing 1-2-3 Formulas

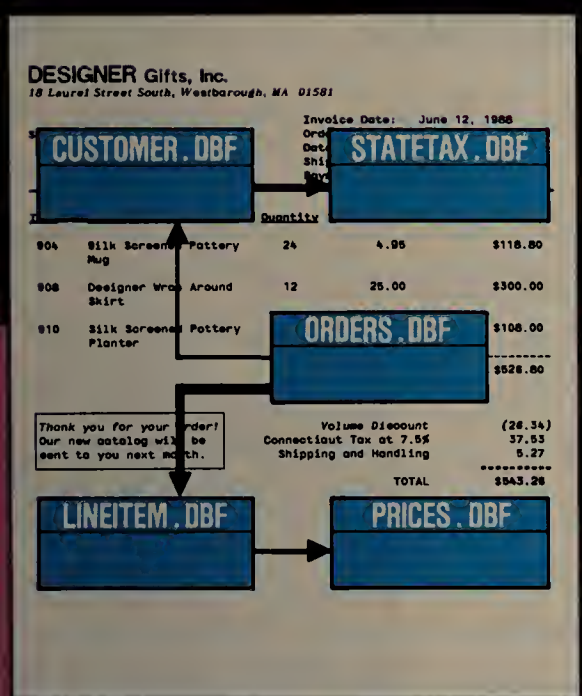
To view *1-2-3* formulas, users usually place the cell pointer on a cell and look in the control panel. If you want to see a formula in its cell, simply place the pointer on the cell and issue */Range Format Text* <Enter> <Enter>. *1-2-3* displays the formula in that cell.

Bruno Terkaly
Corte Madera, California

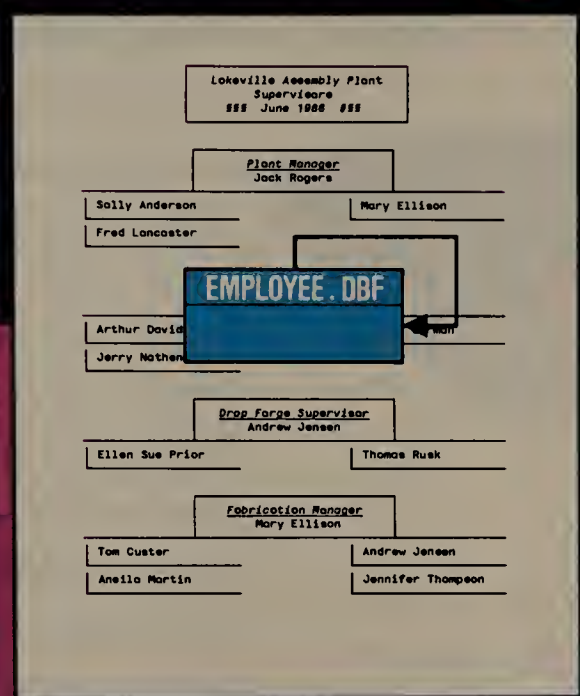
New Lotus version available. Call for details

R&R Relational Report Writer® for dBASE®

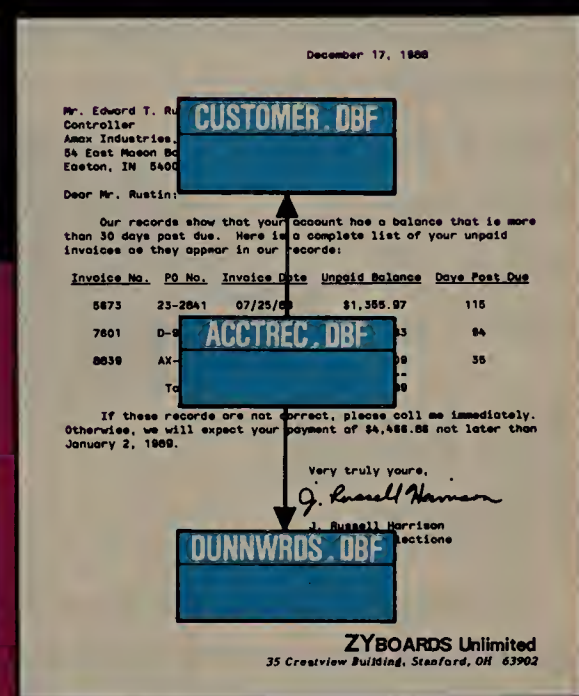
Create reports like these quickly without programming.



Summary Reports



Simple Reports



Form Letters

For people who don't program.

R&R has the power, flexibility, and ease-of-use that lets you get information you want out of dBASE, exactly the way you want it. We guarantee it, or your money back.*

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Circle 181 on reader service card

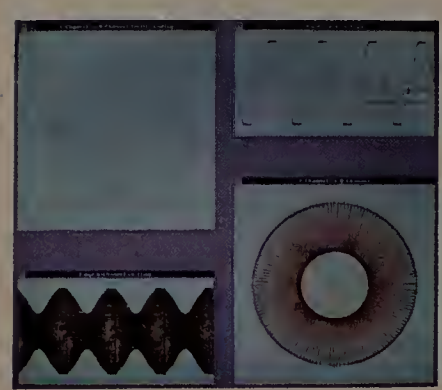
The fastest way to get rid of your hang-ups.

Introducing the Ven-Tel Pathfinder™ 18K. It's the fastest dial-up modem available, and it works better over poor phone lines than any other modem. Plus, it guarantees that your data will be 100% error free.

It's Really Faster.

Though other high-speed modems may *claim* speeds up to 19,000 bps, they rely exclusively on data compression, and can only achieve these speeds on excellent quality phone lines.

But the Pathfinder 18K has a unique ability to adapt to the changing quality of the typical phone line: it falls back in small 100 bps increments and can bounce back again when line conditions improve! So in the real world, it actually transmits nearly twice as fast as other modems—up to 18,000 bps *without* data compression. Keep that in mind when comparing modems.



"Picture-perfect transmission for CAD/CAM and graphics."

What's more, if lines do deteriorate badly, the Pathfinder 18K's own data compression automatically kicks in to keep you moving at the highest possible speed.

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CAD/CAM * software downloading * high-speed LAN gateways * desktop publishing * remote computer diagnostics. They're all feasible now, thanks to the Pathfinder 18K's great speed and accuracy. Besides which, the Pathfinder 18K can perform more routine tasks in a fraction of the time, and at a fraction of the cost, of conventional modems.

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Circle 11 on reader service card

CONSUMER WATCH

Advice and information for the computer consumer

This month: A look at hard drives and how to unscramble the meaning of MFM, RLL, ARLL, SCSI, and ESDI

Anita Amirrezvani

ANTHONY RUSSO

Most people who are shopping for a hard drive—or a system with a hard drive—weigh three key factors: capacity, speed, and price. These are arguably the only features that really matter.

But manufacturers often use (or misuse) technical jargon to push their products. Hard disk drives are a case in point. Acronyms like RLL, ARLL, SCSI, and ESDI swirl around in computer conversation like so many noodles in an alphabet soup.

To start with some basic definitions, RLL and ARLL are both encoding formats—methods of storing data on disk. SCSI and ESDI, on the other hand, are interfaces—methods of getting the hard drive to communicate with the rest of the system.

RLL (run-length-limited) hard drive controllers got a lot of press when they first appeared because they make possible a 50 percent increase over the capacity of MFM (modular frequency modulation) controller setups. But for some consumers, the promise turned sour.

"When RLL controllers first came out, a lot of dealers were advising their customers who didn't know RLL from a zebra just to add an RLL controller to their hard drive to increase capacity," says James Porter, of market research firm Disk/Trend. "In many cases that didn't work."

Although it's technically feasible, many manufacturers flatly discourage users from pairing RLL controllers with non-RLL drives such as MFMs. "Using an MFM drive with an RLL controller voids our warranty," says Dave Weber, Seagate's marketing manager for controllers. "It's really an issue of reliability."

RLL drives are manufactured to a different standard than MFM drives. An RLL drive's surface is usually nickel-plated, instead of coated with oxide, because nickel is smoother and less prone to errors.

Technical specifications differ as well: RLL drives pack in 26 sectors per hard disk track compared with MFM's 16, and data is transferred at a faster rate—7.5 megabits per second instead of 5. These numbers are accepted industry standards.

RLL controllers installed with XT drives cost about the same as MFM setups, so consumers get more data storage for their money. But with ATs, the situation is more complicated. "With a standard AT, the drive tables reside in the motherboard's BIOS," says Dave Evans, manager of storage applications engineering for Western Digital. "If those drive tables don't support RLL, you can't use an RLL drive."

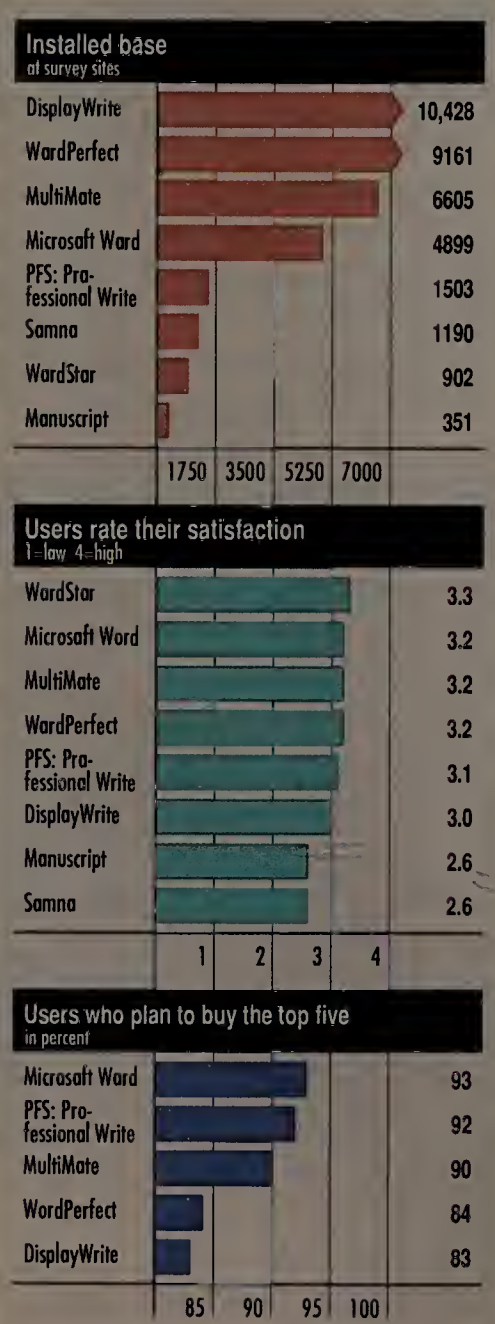
This technical issue may partly explain RLL sales figures. Industrywide numbers are hard to come by, but at Western Digital,

(continues)

RATE YOUR SATISFACTION: Word Processors

When it comes to user satisfactian, nat all word pracessors are created equal. *WordStar* ranks the highest in this survey, probably because af a recent and long-awaited update. *Micrasaft Word, MultiMate,* and *Ward-Perfect* are clase behind in user satisfactian and high on mast shopping lists. *PFS: Professional Write* also makes a strang showing.

DisplayWrite tops the papularity chart in installed base—mainly because the survey sample included many large IBM sites. But as the following figures show, the ward pracessing market remains hotly cantested.



Source: International Data Corporation. From a survey conducted in May 1988 of 191 sites, each with at least 50 PCs.

"about 30 percent of the XT controllers we sell are RLL, compared to 15 percent for ATs," says Alexis Colicchio, a director of marketing.

Consumers may also encounter another type of controller whose specifications are not accepted by the entire industry. Perstor, a manufacturer in Scottsdale, Arizona, makes controllers popularly known as ARLL (advanced RLL). "Because of the negative connotations of RLL, we changed the name ARLL to ADRT (Advanced Data Recording Technology)," says Perstor communications manager Christi Ferri.

Perstor's ADRT 180 controller departs from conventional wisdom on two counts. First, Perstor says the ADRT 180 controller isn't restricted to RLL drives—it can be used with MFM drives to achieve a 90 percent increase in capacity.

Second, the ADRT controller writes 32 sectors per track and transfers data at 9.5 megabits per second—which some manufacturers say is pushing the technology too far. Safa Matin, Perstor's senior electrical engineer, claims the chance of errors is extremely slim and says that Perstor uses sophisticated error correction routines to prevent any data loss.

But some storage experts, like Western Digital's Dave Evans, have their doubts about ARLL technology. "The ARLL controller pushes the media past the limit of what we consider to be safe for good data integrity—that is, past a transfer rate of 7.5 megabits per second," he says. "There's an increased probability that you'd have to rely on error correction code to recover your data. And remember, every time errors have to be corrected you lose performance."

Seagate's position is more guarded. According to Dave Weber, "Seagate has not qualified any ARLL controllers to work with Seagate drives." Weber declined to comment on the issue of reliability.

But what if a user called Seagate and asked, Can I pair an ARLL drive with a Seagate drive? "The answer would be, Talk to the controller company," says Weber.

Consumers who want higher performance can also turn to SCSI (small computer system interface) and ESDI (enhanced system disk interface) drives, both of which provide higher performance than the standard Seagate ST412 (also called the ST506) interface. "Because these interfaces are more advanced, it's possible to put more data reliably on the drive," says Weber. Packing in 36 sectors per track at a transfer rate of 10 megabits per second is not uncommon.

TABLE 1 lists all 5½-inch hard disk drives manufactured by Seagate and lays out some of their specifications. You can use it as a reference when you shop. For best results, consumers buying an RLL hard drive should make sure that the drive and controller are correctly matched. Obtain the model numbers on both parts, then check with the controller company, the drive company, or both. This is particularly important if you're buying the drive from a distant third party—a dealer who may or may not follow the manufacturer's rules.

And now that all the acronyms are familiar, you can CTTH—cut through the hype.

Know the Specs Before You Buy

Drive name	Capacity (in MB)	Average access time (in ms)
Half-height MFM drives		
ST225	20	65
ST251	40	40
ST251-1	40	28
Half-height RLL drives		
ST238R	30	65
ST277R	60	40
ST277R-1	60	28
Half-height SCSI drives		
ST225N	20	65
ST251N	40	40
ST251N-1	40	28
ST277N	60	40
ST277N-1	60	28
ST296N	85	28
Full-height MFM drives		
ST4038	30	40
ST4053	40	28
ST4096	80	28
Full-height RLL drive		
ST4144R	120	28
Full-height SCSI drive		
ST4192N	160	17
Full-height ESDI drive		
ST4192E	160	17

TABLE 1: Here's a list of all Seagate 5½-inch drives and key specifications.

SHOP TALK

Okidata Users Alert

In October 1988, Okidata announced potential problems with its Microline 320 and 321 printers. According to a letter sent to Okidata distributors, "if the printers are left on and unattended for a very long period, there is a potential for excessive heat buildup, a possibility of smoke, and a remote possibility of fire."

Dennis Flanagan, Okidata's senior vice president of sales and marketing, says, "There's only been one known case of a scorched board." Still, to correct the problem, Okidata suspended shipments of the printers and created an upgrade program. Okidata dealers will replace the electronics board with a new board "that adds a circuit to provide better heat dissipation," says Flanagan.

Microline 320 and 321 users should contact their dealers to arrange the replacement. If for some reason the dealer is unavailable, call Arden Colace at Okidata, 609/235-2600, ext. 8589; or try 800/759-8333 to reach Xerox, which is also performing the upgrades. The refurbished product carries a new one-year warranty.

Speaking of Coprocessors

I bought an 80386 Mylex motherboard for $1900 after being assured by one of their dealers that it would support floating-point calculations with a math coprocessor installed. Later, I learned that the board would not support an 80387 coprocessor directly. I had the choice of either plugging in an 80287 chip or buying a special 80387 plug-in board from Mylex which was not yet available.

I called Mylex to determine what the speed trade-offs would be if I bought its plug-in board. A technical spokesperson, who was very evasive, claimed the company had not done any speed trials. Later I discovered that in fact Mylex had run speed tests using *AutoCAD* (painting the cathedral) and that the results were as follows:

- Mylex 386 AT-compatible 10.5-MHz board with 80287: 41 seconds
- Mylex 386 AT-compatible board with 80387 plug-in board: 20 seconds
- Another 386 board with an on-board 80387: 9 seconds

In other words, Mylex was selling semi-functional boards without notifying consumers. When I asked Mylex to take my old board as a trade-in so I could run the floating point calculations at an acceptable speed, they just said, "Why don't you buy one of our new 387 plug-in boards?"

John Brookes
Berkeley, California

Mylex Corporation responds: Many people are so used to thinking about a math coprocessor as a standard feature that they neglect to ask about the specifics.

The Mylex 386 board that Mr. Brookes purchased was the first 386 RAM-caching design on the market, and was delivered in volume before the widespread availability of the 80387. Because the board was intended as an IBM AT system board replacement, it was considered more likely that the buyer would have an 80287 than an 80387.

We offer a plug-in board, the DX387, to provide the higher performance possible with an 80387. Even though the DX387 has a performance disadvantage compared with an on-board 80387, it's still popular among users who want high performance at a moderate cost. Our latest boards support the 80387 directly, and our new Flash Cache Series 25MHz also supports the more powerful Weitek 3167.

Connie E. Austin
Corporate Communications

(continues)

Out of Luck With PC-MOS/386

My experience with PC-MOS/386 may be useful to other readers. My new Dell 386 system and PC-MOS both arrived in December 1987. It was immediately apparent that PC-MOS had serious bugs. Software Link's technical staff was very helpful over the next two months with suggestions and repeatedly guaranteed that the company would fix the problems. But in May 1988, a month after I wrote to The Software Link, a representative called to say the company would neither fix the problems nor refund my money.

The lesson from all of this is not to accept verbal promises, but to return the merchandise promptly and get your money back.

Samuel Raymond
Philadelphia, Pennsylvania

Editor's note: Consumer Watch *sent Mr. Raymond's letter to The Software Link in May 1988 but received no response. Repeated phone calls also failed to elicit a reply. Mr. Raymond's letter was sent again in October 1988. Finally, Software Link provided this answer:*

Our last contact with Mr. Raymond was in May 1988. Our technical support department had been in contact with him since January, and had determined that compatibility problems between PC-MOS and *The Norton Utilities* could not be resolved from our end. Mr. Raymond was sent a letter explaining this and referred to Norton Computing for further help.

We offer a 30-day money-back guarantee on all products. Unfortunately, Mr. Raymond had PC-MOS for more than 30 days before he called technical support for assistance.

Terrie O'Hanlon
Marketing Manager

Down on dBXL

I purchased *dBXL*, a *dBASE III Plus* clone, assuming that applications written in *dBASE* would work with *dBXL*. But in testing an inventory program that works fine with *dBASE*, we noticed a number of problems. For example, the UPDATE and REPLACE commands failed to perform properly, as they had in *dBASE*.

I wrote to Wordtech Systems in April 1988 but received no response. I've received a notice about an upgrade, but because of the problems and the company's lack of concern I haven't taken it up on the offer.

Brian K. Mulry
Sleepy Eye, Minnesota

Wordtech Systems responds: Mr. Mulry was using *dBXL 1.1*, a version that dates from early 1987. Since then, *dBXL* has gone through one major revision and a few minor ones. We've provided Mr. Mulry with an update, which we are confident will take care of his problems.

We have no record of Mr. Mulry's letter to us. Either we never received it or it was overlooked here, in direct violation of our policy. We have reviewed our complaint procedures to make sure that this problem never occurs again.

Daniel C. Berkowitz
Manager of Corporate Communications

PC Plaudits

After buying a TSR manager called *Pop Drop*, I had problems using it with my system. When I explained the difficulties to a representative, he told me the company wasn't familiar with the problem. I expected the usual finger-pointing response: "Sorry, there must be a problem with your hardware."

Instead, the company took on the problem as a challenge and rewrote the program so that it worked on my system. In a world of companies giving C-grade service, this one deserves an A+.

Larry Nau
San Marcos, California

To send correspondence or to submit material for publication in this column, please see How to Contact PC World, page 4. ●

POWER TIP NO. 35

1-2-3 Copy Controls Cursors

1-2-3 users usually initiate the Copy command with the cell pointer in some cell in the source range. After 1-2-3 copies the range, it automatically returns the pointer. To have the pointer end up in the upper left cell of the target range, put the pointer there before you enter /Copy. Then press <Esc> or <Backspace>, highlight the source range, and press <Enter> twice.

Bruno Terkaly
Corte Madera, California

It Takes Guts To Turn A Laptop Into A Desktop.

Most desktop computers are entirely too big and too clumsy to make it off the desk, to say nothing of making it out of the office.

Two IBM-compatible internal expansion slots let you expand the T3200's capabilities quickly and easily.

But with the lightweight portable Toshiba T3200, that's no longer a problem.

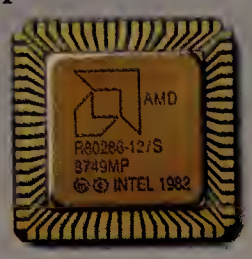
We've squeezed everything you'd expect from a powerful desktop computer into a light, slender 19-pound portable — packaged to go.

A separate numeric keypad speeds data entry.

It has two built-in IBM-compatible expansion slots for networking and mainframe communications. A 12MHz 286 microprocessor for high-speed data handling. A 40MB hard disk for quick, easy access to all your applications. A 720KB, 3½" diskette drive. And a full megabyte of RAM that's expandable to 4MB for memory that can rival even the most muscular desktops around.

A 40MB hard disk gives you fast access to all your most important applications.

It even comes with a built-in EGA gas plasma display and an EGA monitor port — standard features that some desktops consider optional extras.



A 12MHz 80286 microprocessor helps speed data handling.

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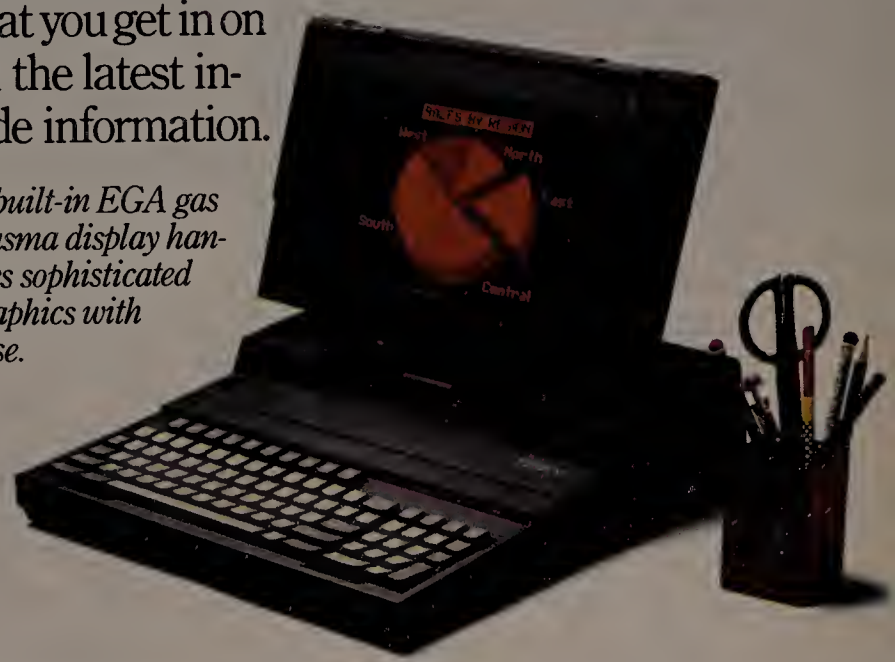

A built-in EGA gas plasma display handles sophisticated graphics with ease.

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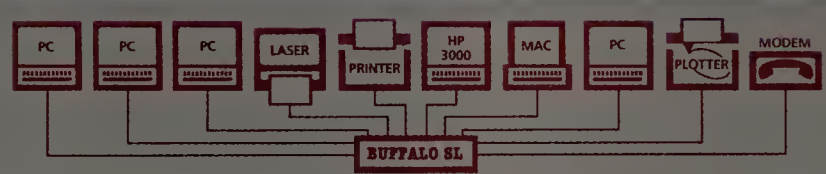

When you can't afford to buy a laser for each PC, the **Buffalo SL™** is the inexpensive way to let everyone share - not just your lasers, but printers, plotters and modems as well. If you don't need simultaneous access to shared files, the **SL** is also an alternative to a LAN at a fraction of the cost.

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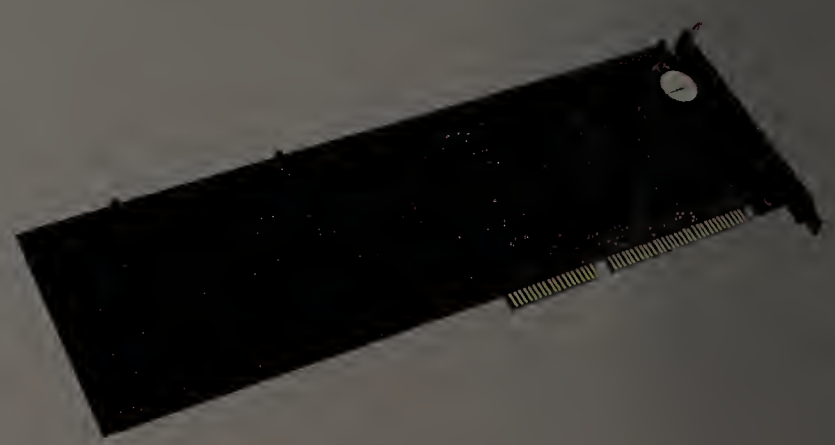

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THE UPGRADE PATH

Hands-on advice for upgrading PCs, compatibles, and peripherals

A 386 makeover for the PC, a painless CD ROM upgrade, and more

Robert Luhn

ANTHONY RUSSO

PC cum 386

If you love your PC but are tired of 8088 performance, you can take several upgrade paths. The cheap path is to pop an 80286 accelerator board into the back of your machine. Performance triples, but using OS/2 is out. The expensive approach: Go whole hog and slide an 80386 motherboard into your PC. You get a tenfold speed boost, 32-bit slots, OS/2 compatibility, and the ability to run 386 control programs like *Windows/386*, but you also take a Jaws-size bite out of your bank account.

If a 286 turbo board doesn't supply enough oomph, but the thought of a 386 motherboard upgrade leaves you dizzy, don't fret. Intel's $1095 16-MHz Inboard 386/PC board might be the solution. The board is easily installed and brings most of the benefits of 80386 processing to aged machines—specifically, to IBM PCs and XTs, Compaq Portables and Portable Pluses, and Tandy 1200HDs. The deal also includes 1MB of 32-bit RAM (expandable to 5MB), dynamic speed switching, an 80387 socket, plus disk caching and EMS 4.0 software.

You install the Inboard 386/PC like most turbo boards: Pull out the PC's 8088, connect the Inboard 386/PC to the empty socket with a special cable, and install the appropriate drivers. Be prepared, however, to disable as much of the system's existing motherboard memory as possible, to remove (and lose your investment in) conventional memory boards, and to reconfigure EMS boards to provide expanded memory only (no backfilled conventional memory).

Park the hard disk's heads, turn off the system, unplug all external cables, remove the system cover, and ground yourself before touching any component. Intel supplies an L-shaped chip puller, but have a pair of tweezer-like pullers on hand. Before you dig in, remember to remove any conventional memory boards and, if necessary, reconfigure installed EMS boards. For the XT upgraded here, you set system switches for 256K: Locate the DIP switch block near the far right slot, and set switches 3 and 4 to the on position with a ballpoint pen. If you aren't adding an 80387 to the Inboard 386, make sure switch 2 is on.

Now remove any boards that obstruct the operation, and locate the 8088 at the back of the PC just behind and to the left of the keyboard connector. Slip the square end of Intel's chip puller between the 8088 and its socket on the end nearest the front of the system, and gently pull the chip puller toward you. Once the processor lifts partially out of its socket, take a pair of tweezer-style pullers, hook each end around the chip, and pull it out. Repeat the procedure with a neighboring 8087, and store both chips in the supplied tubes.

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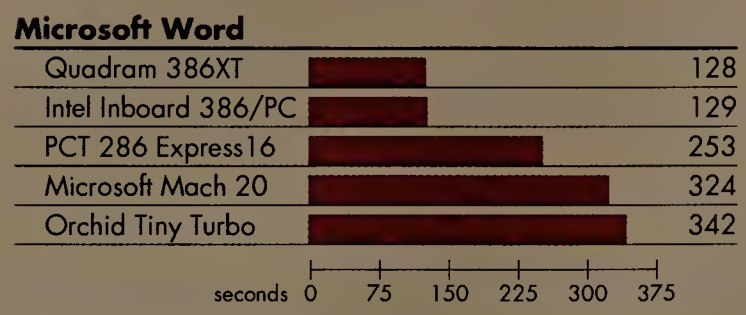
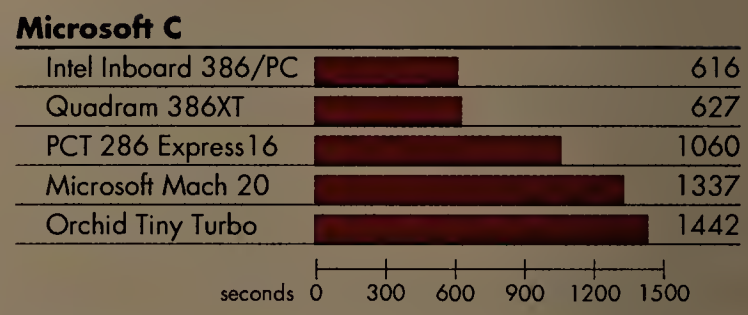
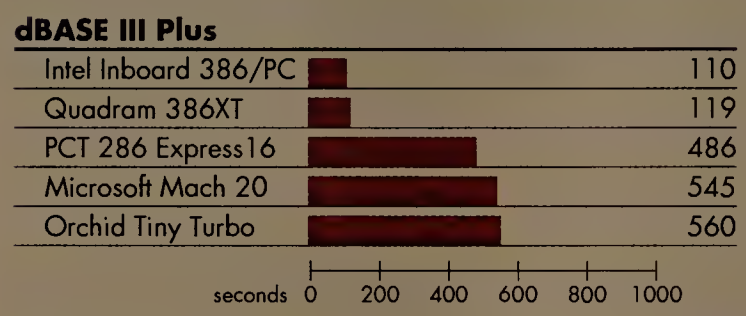
NSTL TEST REPORT

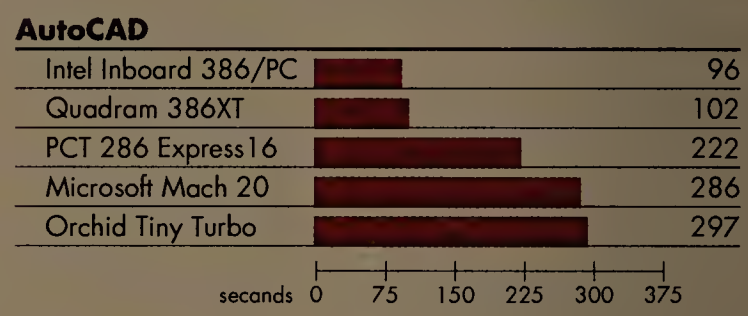
Inboard 386/PC

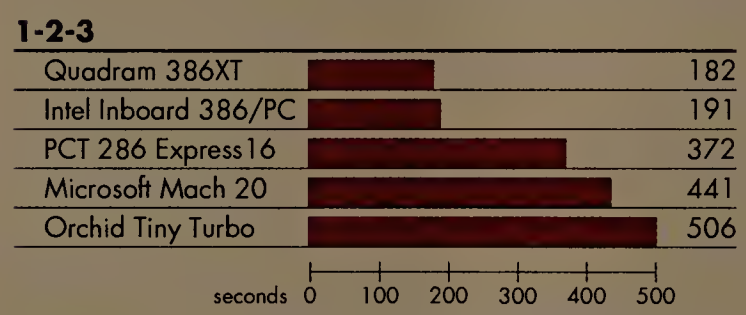
Intel's Inboard 386/PC gives your PC the biggest speed jolt of any 286 or 386 turbo board around.











All accelerator boards were tested on an IBM PC XT with a 10MB hard disk and 640K of RAM. Accelerator boards were tested with the fastest available coprocessor supported: a 16-MHz 80387 for the 80386 cards and an 8-MHz or 10-MHz 80287 for the 80286 cards. Boards were tested with a 256K extended memory disk cache if additional memory was supplied by the card, or with a 64K conventional memory disk cache if no extended or expanded memory was available.

Microsoft Word 4.0
A *Microsoft Word* macro loads a 35-page, 140-paragraph document and performs search-and-replace and spell-checking operations. The first page of the document is then printed. Although the results of the benchmark depend primarily on processor and memory access speeds, display adapter and hard disk speeds are also contributing factors.

dBASE III Plus 1.1
The *dBASE III Plus* test measures the time required to prepare and print a report of post-due invoices. The report includes calculated fields and is based on three files: a 500-record customer file, a 1000-record invoice file, and a 2000-record item file. When disk caching is not used, the random access speed of the hard disk is, after processor speed, the most significant factor in this benchmark. With disk caching, sequential read performance becomes more important than random access.

1-2-3 2.01
In this benchmark, a *1-2-3* macro executes a series of recalculations using five different formulas within a 75-by-75-cell matrix. Because there are few screen updates and no screen access is required, the results depend almost entirely on processing and memory access speeds.

Microsoft C 5.0
The Microsoft C benchmark measures the time required to compile and link XLISP, a public-domain program composed of 25 C source code files. The most important factors in this benchmark are processor and memory access speeds. The performance of the hard disk is also a factor; generally, disk caching has little effect.

AutoCAD 9
In this benchmark, a three-dimensional sample drawing is retrieved and displayed using *AutoCAD's* EGA driver. The zoom function is used to display the drawing from various perspectives; then the full drawing is printed. The results of the benchmark depend primarily on the speeds at which the processor and coprocessor operate and at which memory is accessed. The performance of the display adapter and the hard disk also have some effect.

Data based on tests designed and conducted by National Software Testing Laboratories (NSTL). All rights reserved.

At this point, Intel's directions for plugging the Inboard 386 data cable into the 8088 socket are a bit unclear. Set the cable's 8088-shaped connector in the vacated socket so that the attached cable points away from the power supply. Take a final peek through the PC's backplane to make sure the pins are straight and properly lined up, and then push down evenly on both ends until the connector is flush with the socket.

Now the fun begins. If you pop the Inboard 386 into slot 4 or 5 as directed in the manual, and then reinstall previously removed boards (probably floppy and hard disk controllers with their myriad ribbon cables), you'll have a hard time connecting Intel's data cable to the Inboard 386. Instead, return the removed boards to their homes first, rest the Inboard 386 in the closest available slot, connect it to the data cable, and then seat the board in the slot. Screw the board to the backplane, reassemble the PC, and fire up the system.

As with most Intel products, configuring the Inboard 386 is a snap. Slip the supplied utility disk into drive A:, type SETUP, and answer the questions. The prompt-driven program analyzes system RAM and peripherals, lets you allocate the Inboard's extended RAM for a disk cache, asks how you want to use any installed expanded memory and modifies CONFIG.SYS and AUTOEXEC.BAT accordingly, and copies the Inboard 386 drivers and utilities to the PC's boot disk or hard drive. The system will reboot, and you're ready to go. If 386 processing is too much for some programs, you can dynamically change processor speed from 16 MHz to as low as 8 MHz by simultaneously pressing the left <Shift> key, <Ctrl>, <Alt>, and a number from 4 to 1.

Although allocating memory is easy enough, consider your choices carefully. If the Inboard 386 is the sole memory source, it provides 640K of conventional RAM and 256K of extended RAM. (A supplied utility can convert the latter to expanded RAM.) If an AboveBoard or comparable EMS board is installed, you must either dedicate it entirely to expanded memory or disable (or remove) it.

Unfortunately, you must disable all expanded memory (and buy at least 1MB of memory for the Inboard) to run the few 386 operating environments the Inboard supports. Quarterdeck's *Desqview*/QEMM combination will run straight out of the box, but if you've got a yen for *Windows/386*, you must buy a modified version from Intel for $99. Environments on the no-go list include Concurrent DOS/386, VM/386, and PC-MOS/386.

Nonetheless, the Inboard 386 is a pretty painless way to get 386 power for your system. Although the board is limited to a few machines, the company expects to support some Leading Edge 8088-based systems in the near future. So keep those checkbooks handy.

WHERE TO BUY

Inboard 386/PC
Intel Corp.
5200 N.E. Elam Young Pkwy.
Hillsboro, OR 971242-6497
800/538-3373, 503/629-7354
List price: with 1MB of RAM $1095; 1MB RAM module $795, 2MB module $1495, 4MB module $2295
Requirements: DOS 2.00 or later version (DOS 4.00 not recommended); IBM PC or XT, Compaq Portable or Portable Plus, or Tandy 1200HD
Warranty: five years
Extended warranty: none
Technical support: toll-free number, M–F 7–5
Other support services: company BBS
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Megabytes in Minutes

Need ready access to business statistics, hundreds of legal citations, stock quotes, or a couple of encyclopedias? In the past, you either trudged off to the library or dialed up a very expensive on-line data base and started searching. But with a CD ROM drive, you can have libraries at your fingertips. Problem is, CD ROM drives haven't been nearly as friendly as their audio cousins. Instead of just plugging a drive in and swimming through megabytes of data, installing a CD ROM drive (especially an internal unit) meant struggling with DIP switches, jumpers, drivers, and DOS patches.

But with Amdek's half-height internal Laserdek 1000 CD ROM drive for the AT and compatible systems, such hassles are history. Physically installing the drive literally takes 10 minutes, and an installation program automatically adjusts the system's CONFIG.SYS and AUTOEXEC.BAT files and copies over the necessary drivers. The drive even includes stereo CD audio circuitry, a headphone jack, and a memory-resident control program complete with search, scan, and

(continues)

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memory functions—so if you want to run *WordPerfect* and listen to Prince, you can.

If you've ever installed a floppy or hard disk drive, you'll find this upgrade a déjà vu experience. Shut down the system, remove the hood, and plug the Laserdek controller board into a free slot. Next, set the drive on top of a flat surface and attach the supplied drive rails, with the tapered ends at the back of the unit. Slide the Laserdek almost all the way into a free half-height bay, then attach the keyed data cable to the back of the drive and the other end to the controller board. Snap a free power supply plug into the drive's white plastic receptacle, and attach a ground wire to the small metal tongue jutting just below. Slide the drive all the way in, reassemble the system, and turn the machine on.

Slip Amdek's *CD ROM Utilities* disk into drive A:, type INSTALL, and you're guided through a brief configuration procedure. Reboot the PC, and the Laserdek is treated as the next logical drive. And that's about it.

The sole irritation is the Laserdek's removable CD ROM disk caddy. Instead of dropping a disk into a built-in drawer (as you would with an audio CD player), you must squeeze open a flimsy cartridge, maneuver a disk in, and then shove the assembly into the drive. The manual sternly warns you *not* to touch the CD ROM when you remove it, but with this arrangement you have no choice.

Keep in mind that standards in the CD ROM industry are constantly evolving. Since the Laserdek conforms to the High Sierra format, it probably can't read CD ROM disks mastered last year. Note, too, that all CD ROM packages are different. Some require extensive patching of DOS, while others force you to run search software from the system's hard disk. In most cases, however, you can just log on to the Laserdek drive, find the .BAT or .EXE file on the CD ROM, and take it away. If you've got the money and the need, you should too.

WHERE TO BUY

Laserdek 1000
Amdek Corp.
1901 Zanker Rd.
San Jose, CA 95112
800/PCAMDEK, 408/436-8570 or 408/435-2832 (technical support)
List price: $895
Requirements: 640K, DOS 2.00 or later version; hard disk recommended
Warranty: one year parts and labor
Extended warranty: none
Technical support: no toll-free number, M–F 6–6
Other support services: 13 service centers throughout U.S.
For more information, circle 741 on reader service card.

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Test drive DOS 4.0, swap printers with a DOS utility, take an honest look at system security, send indented WordPerfect E-mail documents, and resolve DMA channel contention.

Karl Koessel

ANTHONY RUSSO

Peaceful Coexistence

Q. *I'm trying to divide my hard disk into two primary partitions in order to keep DOS 3.3 and 4.0 separate. (I'm not yet sold on 4.0 and would like to try it out before removing 3.3.) Both manuals state that the hard disk can be divided into four partitions, only one of which is active at a time. Whenever I try to create additional partitions with FDISK, however, I get an error message saying a primary partition already exists. Is there an easy way to get both DOS versions on the hard disk without directly modifying the partition table? Also, when multiple operating systems occupy the same hard disk, which controls the partition table?*

Albert S. Eble
Grayslake, Illinois

A. Let's take the second question first. The active operating system allows the user to create or remove its partitions and to designate any primary partition created by an altogether different operating system (for example, OS/2, UNIX, or Pick) as the active partition. When you change the active partition, the PC restarts; the operating system of the new active partition boots and has control.

As for the first question, there isn't an easy way to create two primary partitions of a single operating system on one disk. Consequently, there's no easy way to enable the hard disk to boot your choice of DOS version.

You can, however, create a floppy disk that lets you boot DOS 4.0 from the A: drive but does not need to remain in the drive thereafter. Booting from the A: drive lets you try out DOS 4.0 whenever you like without the speed constraints of the floppy drive (except, of course, during start-up). And, just by opening drive A:'s door, you can boot DOS 3.3 as you do now.

To create such a DOS 4.0 boot disk, insert the DOS 4.0 Install disk in drive A: and reboot (or turn on) the system. Eventually, you'll see the opening screen of the Select program. (If you're using 5¼-inch disks, replace the Install disk with the Select disk and press <Enter> to bring up the opening screen.) Press **<Enter>** to continue; read the screens that follow, and answer the prompts. When you come to the 'Select Installation Drive' screen, press **1** to choose drive C: (go ahead, you won't be replacing DOS 3.3). On the next screen, type **40** to change the name of the subdirectory that will hold the DOS 4.0 nonsystem files to DOS40. Then press **<Tab>**, select option **2**, and press **<Enter>** so you don't overwrite DOS 3.3.

(continues)

Continue with the installation, but label the disk created by the Select program *DOS 4.0 Test Drive Boot Disk* instead of *Select Copy*. When the installation is complete, remove the disk from drive A: and reboot the system. After DOS 3.3 has booted, insert the 4.0 Test Drive disk into drive A: and, at the DOS prompt, type **COPY C:\CONFIG.400 A:\CONFIG.SYS** and press **<Enter>**. Then type **COPY C:\AUTOEXEC.400 A:\AUTOEXEC.BAT** and press **<Enter>**.

At this point, you can reboot to run DOS 4.0, or open drive A:'s door and reboot to run your system as usual. However, now's a good time to edit the Test Drive disk's CONFIG.SYS and AUTOEXEC.BAT files so they imitate their 3.3 counterparts. Note that in the Test Drive disk's CONFIG.SYS file, any DEVICE commands that designate DOS-supplied drivers, such as ANSI.SYS or VDISK.SYS, must specify the 4.0 drivers in the \DOS40 directory, and the default values for the FILES and LASTDRIVE commands may need to be increased. In the 4.0 AUTOEXEC.BAT file, the PATH command should list the C:\DOS40 directory, *not* drive C:'s DOS 3.3 directory; external DOS commands must execute from the \DOS40 directory, not the DOS 3.3 directory; and DOSSHELL should remain the last command.

WordStar Printer Swap

Q. *I have an AT compatible with letter quality and dot matrix printers connected to parallel ports LPT1: and LPT2:, respectively. Although most programs let me use either printer simply by selecting the appropriate port, the program I use most often,* WordStar 3.3, *will print only to LPT1:. I'd like to use* WordStar *with the draft printer as well. Short of a switch box, is there any way to pick the printer I want* WordStar *to use?*

Danny Blatt
Montreal, Quebec, Canada

A. *WordStar 3.3* can be patched (modified) so it prints to LPT2: (or LPT3:), but not so it can

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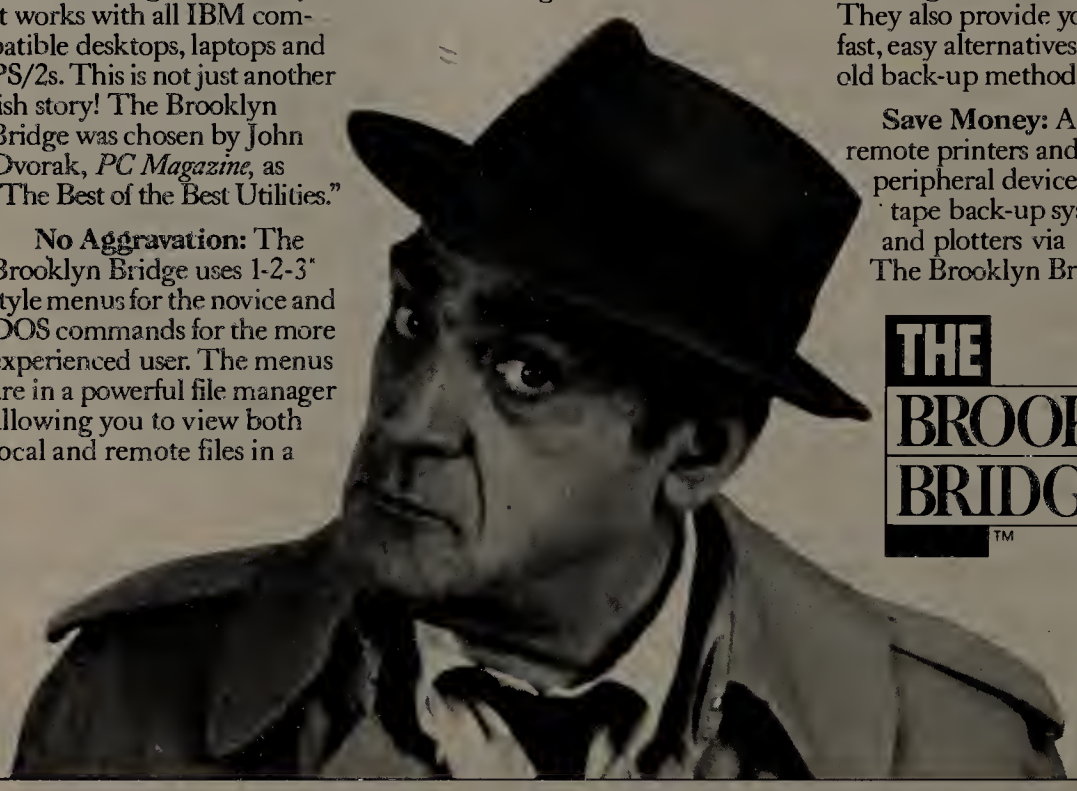

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Circle 47 on reader service card

choose between ports. But SWAPLPTS.COM (see **FIGURE 1**) can swap LPT1:'s port address for LPT2:'s. The program is useful not only for *WordStar 3.3* but for any program that doesn't let you select printer ports.

SWAPLPTS first tells you what printers are connected to LPT1: and LPT2:, and then asks if you'd like to swap them. Answer *Y*, and the utility swaps the ports and starts over. Answer *N* when the desired printer is connected to LPT1:.

You can execute this little program from the DOS prompt before you run *WordStar* or after selecting 'R Run a program' from the main menu. (If you use *WordStar 4.0* or a later version, you can also run SWAPLPTS from within a document. However, you may instead want to specify the printer port, as those versions allow you to do.)

To create SWAPLPTS.COM, place in drive A: a disk containing a copy of DEBUG.COM (from the DOS Supplemental Programs or Operating disk) with space to hold the printer-swapping program. At the A> prompt, type **DEBUG** and press **<Enter>**. Then type **D40:8 L 2** and press **<Enter>**. Two pairs of hexadecimal numbers (BC 03, for example) will appear. Write them down, second pair first and without the space, on a piece of paper (03BC).

Now type the bold characters in **FIGURE 1**, pressing <Enter> at the end of each line as shown. Do not type any spaces before pressing <Enter>. DEBUG displays the other characters; the *xxxx* will be a four-digit hexadecimal number that varies from machine to machine.

Type very carefully. The numbers after the *xxxx*: on your screen must match those in the figure. If you make a mistake, start over. In the line labeled :010A, don't type the four exclamation points. Instead, replace them with the hexadecimal number you wrote down. In lines :01A0, :01C0, and :01D0, you can replace the characters PRINTER_1 and PRINTER_2 with more descriptive names for your printers (for example, EPSON-FX80 and SERIES II), but you

(continues)

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```
-A 100                                  <Enter>
xxxx:0100  PUSH  DS                     <Enter>
xxxx:0101  MOV   AX,40                  <Enter>
xxxx:0104  MOV   DS,AX                  <Enter>
xxxx:0106  MOV   BX,[8]                 <Enter>
xxxx:010A  MOV   CX,!!!!                <Enter>
xxxx:010D  CMP   BX,CX                  <Enter>
xxxx:010F  POP   DS                     <Enter>
xxxx:0110  JZ    121                    <Enter>
xxxx:0112  MOV   SI,1F4                 <Enter>
xxxx:0115  MOV   BYTE PTR [SI],32       <Enter>
xxxx:0118  MOV   SI,1FA                 <Enter>
xxxx:011B  MOV   BYTE PTR [SI],31       <Enter>
xxxx:011E  JMP   12D                    <Enter>
xxxx:0120  NOP                          <Enter>
xxxx:0121  MOV   SI,1F4                 <Enter>
xxxx:0124  MOV   BYTE PTR [SI],31       <Enter>
xxxx:0127  MOV   SI,1FA                 <Enter>
xxxx:012A  MOV   BYTE PTR [SI],32       <Enter>
xxxx:012D  SUB   CX,CX                  <Enter>
xxxx:012F  MOV   DX,194F                <Enter>
xxxx:0132  MOV   AX,600                 <Enter>
xxxx:0135  MOV   BH,16                  <Enter>
xxxx:0137  INT   10                     <Enter>
xxxx:0139  SUB   DL,DL                  <Enter>
xxxx:013B  MOV   SI,1F4                 <Enter>
xxxx:013E  MOV   DH,[SI]                <Enter>
xxxx:0140  SUB   DH,31                  <Enter>
xxxx:0143  MOV   AH,2                   <Enter>
xxxx:0145  MOV   BH,0                   <Enter>
xxxx:0147  INT   10                     <Enter>
xxxx:0149  MOV   DX,1A0                 <Enter>
xxxx:014C  MOV   AH,9                   <Enter>
xxxx:014E  INT   21                     <Enter>
xxxx:0150  MOV   DX,1F4                 <Enter>
xxxx:0153  MOV   AH,9                   <Enter>
xxxx:0155  INT   21                     <Enter>
xxxx:0157  MOV   DX,1CA                 <Enter>
xxxx:015A  MOV   AH,9                   <Enter>
xxxx:015C  INT   21                     <Enter>
xxxx:015E  MOV   DX,1FA                 <Enter>
xxxx:0161  MOV   AH,9                   <Enter>
xxxx:0163  INT   21                     <Enter>
xxxx:0165  MOV   DX,200                 <Enter>
xxxx:0168  MOV   AH,9                   <Enter>
xxxx:016A  INT   21                     <Enter>
xxxx:016C  MOV   AH,1                   <Enter>
xxxx:016E  INT   21                     <Enter>
xxxx:0170  CMP   AL,79                  <Enter>
xxxx:0172  JZ    178                    <Enter>
xxxx:0174  CMP   AL,59                  <Enter>
xxxx:0176  JNZ   192                    <Enter>
xxxx:0178  PUSH  DS                     <Enter>
xxxx:0179  MOV   AX,40                  <Enter>
xxxx:017C  MOV   DS,AX                  <Enter>
xxxx:017E  MOV   BX,[8]                 <Enter>
xxxx:0182  MOV   CX,[A]                 <Enter>
xxxx:0186  MOV   [8],CX                 <Enter>
xxxx:018A  MOV   [A],BX                 <Enter>
xxxx:018E  POP   DS                     <Enter>
xxxx:018F  JMP   100                    <Enter>
xxxx:0192  MOV   AX,4C00                <Enter>
xxxx:0195  INT   21                     <Enter>
xxxx:0197                               <Enter>
-A 1A0                                  <Enter>
xxxx:01A0  DB    'The PRINTER_1 pr'     <Enter>
xxxx:01B0  DB    'inter is connect'     <Enter>
xxxx:01C0  DB    'ed to LPT$The PR'     <Enter>
xxxx:01D0  DB    'INTER_2 printer '     <Enter>
xxxx:01E0  DB    'is connected to '     <Enter>
xxxx:01F0  DB    'LPT$#:',D,A,'$'       <Enter>
xxxx:01FA  DB    '#:',D,A,'$'           <Enter>
xxxx:0200  DB    'Do you want to s'     <Enter>
xxxx:0210  DB    'wap the printers'     <Enter>
xxxx:0220  DB    27,' port assignmen'   <Enter>
xxxx:0230  DB    'ts? $'                <Enter>
xxxx:0235                               <Enter>
-R CX                                   <Enter>
CX 0000
:135                                    <Enter>
-N SWAPLPTS.COM                         <Enter>
-W                                      <Enter>
Writing 0135 bytes
-Q                                      <Enter>
```

FIGURE 1: Enter these commands into DEBUG to produce SWAPLPTS.COM.

must use exactly 9 characters (spaces count as characters). Note that there is a space before the last apostrophe in lines :01D0 and :01E0.

That's it—SWAPLPTS.COM is now on the disk in drive A:. Copy it to a directory that's listed in your system's PATH so you can use it whenever you want.

System Security

Q. *I can bolt my XTs and ATs to the desktop to secure them from theft. I can also lock the system unit so it can't be opened. I can even lock the keyboards. But as long as users can boot from a floppy disk, the files on my hard disk are vulnerable. Can I force a hard disk boot even if there is a system disk in drive A:? If users can boot only from drive C: and not drive A:, I believe my modified COMMAND.COM can handle the passwords and other devices I use for data protection.*

Ian McCutcheon
Toronto, Ontario, Canada

A. Booting from the system disk in drive A: is controlled by the system's ROM BIOS. Those

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ROMs cannot be modified. Their code *could* be copied, modified, and put into new ROMs, but on top of the considerable logistic hassles, you'd have to deal with copyright licensing. All things considered, installing a modified ROM BIOS is not a practical solution.

For systems that have only one floppy drive, you can attach the floppy disk drive controller cable's drive B: connector to the floppy drive in the place of the drive A: connector, and reset the system switches to indicate the presence of two floppy disk drives. Your users will receive an error message when they boot up, but pressing <F1> will let the system continue, booting from drive C:. Drive C:'s AUTOEXEC.BAT file can then issue the DOS command ASSIGN A=B so that the single floppy drive can be referred to as A: or B:. This technique is not particularly elegant, but it works. Note, however, that you must separate the keyboard lock from the system unit lock so people can use the keyboard without having to unlock the system unit (follow the keylock's wires down to their motherboard pins and replace them with a jumper). With the system unit unlocked, a user could simply open it up, reconnect the drive A: connector, and boot from the A: drive. Also, in the IBM AT and most compatibles, the system unit's lock assembly is mounted in plastic; such units aren't too difficult to break into. The Compaq Deskpros are among the few compatibles with system unit locks mounted in steel.

For more ideas on system security, read "Blanket Security" in this issue of *PC World*. One of the products mentioned in that article, such as a board that demands the correct password before it allows the system to boot at all, may give you the security you desire.

Perfect ASCII

Q. *Unlike its predecessor,* WordPerfect 5.0 *does not convert tabs or indents to hard spaces when the file is saved as an ASCII (DOS Text) file. I use the outline feature with indented paragraphs a lot, saving those files as ASCII for transmission via PROFS or MCI Mail. When I use the DOS command TYPE to display the file, the various outline levels look fine, but the first line of any indented paragraph is misaligned.*

I can use WordPerfect's *search-and-replace function to change the tabs to spaces, but that still doesn't solve the alignment problem for indented paragraphs within an outline. The maintenance update mailed last August didn't fix this problem, at least not for my IBM 3270. Any suggestions on how to get my E-mail formatted properly?*

Henry Owen
Minneapolis, Minnesota

A. You're not the only one to bemoan *WordPerfect 5.0*'s inability to convert tabs to hard spaces. Users have complained loudly, and WordPerfect has put the capability back into *WordPerfect 5.0* via another "maintenance" update. Contact WordPerfect or your local dealer for a copy.

Change the Channel

Nick Nastasi of Alloy Computer Products wrote in response to an item about contention between a memory-resident clock program and an Alloy tape drive trying to use the same DMA channel (see "At the End of My Tape," *The Help Screen, PCW,* November 1988). He says that if the tape drive is controlled by an Alloy board (instead of by the computer's floppy disk drive controller), its DMA channel may be changed (see the manual) so the tape drive will work while the memory-resident program is loaded.

To send correspondence or to submit material for publication in this column, please see How to Contact PC World, page 4. ●

POWER TIP NO. 36

Speedy Text Moves Between WordStar Windows

WordStar 5.0's built-in command for moving blocks of text between windows, <Ctrl>-KG, is slow because it rewrites the entire screen. For faster block moves, use the undelete command, <Ctrl>-U.

Define the block you want to move in the first window with <Ctrl>-KB and <Ctrl>-KK, delete it with <Ctrl>-KY, press <Ctrl>-OK to switch to the second window, and press <Ctrl>-U.

George Beinhorn
Nevada City, California

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Max. RAM On System	24MB	24MB	16MB
Math Coprocessor Socket	Yes	Yes	Yes
Use of Weitek Board	Yes	Yes	No
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Edited by Tom Swan

Relief Mappings

If you're tired of typing long path names such as C:\DATA\MAIL\LETTERS, you can get some relief with VDRV.BAT [see **LISTING 1**], which assigns drive letters to subdirectories. Mapping a subdirectory to a virtual drive will save you time; you can use drive letters such as F:, G:, H:, and so on instead of long path names, just as though the subdirectories were independent drives. For example, after using VDRV.BAT, you can change to the C:\DATA\MAIL\LETTERS directory by simply entering F:.

VDRV.BAT accepts pairs of parameters: The first of each pair is the virtual drive letter to be assigned, and the second is the full path to the subdirectory receiving the assignment. For example, the command VDRV F: C:\LANGUAGES assigns the virtual drive letter F: to the drive C: subdirectory \LANGUAGES. You can map more than one subdirectory with a single VDRV command by following it with two or more pairs of assignments.

Normally, you won't want to map drive letters already in use by your system; reassigning a RAM disk's drive letter renders the drive temporarily inaccessible. By default, DOS's last acceptable drive letter is E:. You can't assign a virtual drive letter beyond E: unless you first insert (or modify) the CONFIG.SYS file command LASTDRIVE=*x* (where *x* is the greatest drive letter you will use) and reboot.

VDRV.BAT generates an error message if necessary, and the user can get help on using the command by entering VDRV HELP (in either all uppercase or all lowercase).

Leon Chalnick
Rancho Palos Verdes, California

Editor's note: The original purpose of the DOS SUBST command was to let you use older programs that didn't recognize subdirectories but did allow you to preface file names with drive letters. To release an assignment—F: for example—type VDRV F: /D. You can then use F: in a new assignment. To see all current assignments, simply type VDRV and press <Enter>.

With virtual drive assignments in effect, CHDIR, MKDIR, RMDIR, and PATH may not work as you expect. Also, you should not use ASSIGN, BACKUP, DISKCOMP, DISKCOPY, FDISK, FORMAT, JOIN, LABEL, or RESTORE on virtual drives. For this reason, it's probably not a good idea to have AUTOEXEC.BAT reassign drive letters automatically at boot time.

(continues)

```
@ECHO OFF
:TOP
IF "%1"=="help" GOTO HELP
IF "%1"=="HELP" GOTO HELP
SUBST %1 %2 >NUL
IF ERRORLEVEL FF GOTO GOOD
IF ERRORLEVEL 1 GOTO ERR_MSG
:GOOD
SHIFT
SHIFT
IF "%1"=="" GOTO EXIT
GOTO TOP
:ERR_MSG
ECHO.
ECHO ERROR--One or more of the following errors has occurred:
ECHO.
ECHO The drive letter to be assigned is in use, is a networked
ECHO drive, is the default drive, is the same as the drive in
ECHO the path to be mapped, is incorrectly entered, or is
ECHO greater than E or the LASTDRIVE specified in CONFIG.SYS.
ECHO The path cannot be found.
ECHO One of the parameters is missing.
ECHO.
:HELP
ECHO To make virtual drive assignments, enter one or more pairs
ECHO of parameters. Each pair must consist of a virtual drive
ECHO letter and a full, valid subdirectory path. For example:
ECHO.
ECHO VDRV F: C:\UTIL\TOOLS
ECHO.
ECHO To remove a virtual drive assignment, use that drive letter
ECHO for the first parameter and /D for the second parameter.
:EXIT
ECHO.
ECHO The current mappings, if any, are:
SUBST
```

LISTING 1: VDRV.BAT assigns virtual drive letters to subdirectories.

Day In, Day Out

Rusty Brown's DATECHEK.COM ["Batch of the Day," *Star-Dot-Star, PCW,* May 1988] returns a different ERRORLEVEL value for each day of the week. Using that program as a guide, I wrote two similar programs to find the month and date as well. To create these programs, run the DOS utility DEBUG.COM and type in the following commands, pressing <Enter> at the end of each line, including the two blank ones:

```
N MONTH.COM
A
MOV AH,2A
INT 21
MOV AL,DH
MOV AH,4C
INT 21

RCX
A
W
N DAYNUM.COM
A 104
MOV AL,DL

W
Q
```

MONTH.COM returns an ERRORLEVEL value from 1, for January, to 12, for December. DAYNUM.COM returns an ERRORLEVEL value from 1 to 31. As with DATECHEK.COM, remember to check higher ERRORLEVEL codes first, as all values greater than or equal to ERRORLEVEL evaluate as true.

Vincent D. O'Connor
Babbitt, Minnesota

Editor's note: Copy MONTH.COM and DAYNUM.COM to a PATH directory. You'll undoubtedly find practical uses for the programs—for example, to execute commands on specified dates. BIRTHDAY.BAT (**LISTING 2**) *offers a lighthearted demonstration of how to wish someone—in this case, George Washington—a happy birthday on February 22. You can change the date by setting the IF ERRORLEVEL values to the month and date one greater than the birthday. Set the IF NOT ERRORLEVEL values to the exact month and date numbers. Append the modified BIRTHDAY.BAT to AUTOEXEC.BAT to wish yourself or anyone else many happy returns once a year.*

```
echo off
month
if errorlevel 3 goto exit
if not errorlevel 2 goto exit
rem ** Month is February (2)
if errorlevel 23 goto exit
if not errorlevel 22 goto exit
rem ** Date is 22nd
echo ---------------------------
echo Happy Birthday to you.
echo Happy Birthday to you.
echo Happy Birthday, dear George.
echo Happy Birthday to you!
echo ---------------------------
pause
:exit
```

LISTING 2: BIRTHDAY.BAT uses MONTH.COM and DAYNUM.COM (see FIGURE 1) to "sing" Happy Birthday to George Washington on February 22.

<Ctrl>-<F10>	Turn on macro recorder
<Alt>-D	Name double-space macro
<Shift>-<F8>	Select line format
162<Enter>00	Specify double-spacing
<Ctrl><F10>	Turn off macro recorder
<Ctrl><F10>	Turn on macro recorder
<Alt>-S	Name single-space macro
<Shift>-<F8>	Select line format
161<Enter>00	Specify single-spacing
<Ctrl>-<F10>	Turn off macro recorder

FIGURE 1: These WordPerfect macros change text from single-spaced to double-spaced, and vice versa.

Doubles, Anyone?

Changing text entry in *WordPerfect* from single- to double-spaced and vice versa is a snap with a pair of simple macros. To create the macros, load any document and enter the keystrokes [listed in the left column of **FIGURE 1**]. Then press <Alt>-D to enter double-spaced text; press <Alt>-S to return to single spacing.

Bernard D. Sommers
Maitland, Florida

Getkey Gets Correction

When I read *The Help Screen* and *Star-Dot-Star*, I usually find something useful. The October issue was no exception—GETKEY.COM and GETKEYD.COM ["All Keyed Up," *Star-Dot-Star*, *PCW*, October 1988] are just the tools I need. However, there's a bug in the instructions: MOV AL,00 at *xxxx*:0100 should be changed to MOV AH,00.

Bob Billingsley
Mercer Island, Washington

Editor's note: The original programs work because COMMAND.COM sets register AH to zero before executing a program, a little-known fact that may or may not be true in future DOS versions. Therefore, this change is recommended for safety even though you won't notice any difference in operation under current versions of DOS.

Lazy Formfeeds

Tired of having to get up and walk across the room just to push my printer's formfeed button, I wrote a short program, FF.COM, to do it for me. To make yourself a copy, save the following lines in a plain ASCII file called FF.MAK:

```
A100
MOV DL,C
MOV AH,5
INT 21
MOV AX,4C00
INT 21

N FF.COM
R CX
B
W
Q
```

(You must include the blank line after the second INT 21.) With DEBUG.COM in the same directory as FF.MAK (or available via the PATH command), enter the DOS command DEBUG < FF.MAK. With your printer on line, type FF and press <Enter> to formfeed your printer.

(continues)

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Picky .PIC Problem

Due to a production error in ".PICs With a View" in December's column, the command to create VIEWPIC.COM erroneously contains a greater-than symbol. The correct command is **DEBUG DEMO.PIC < PIC2COM.PAT**.

DEVELOPER'S TOOLBOX

Programming Far From Home

I've just returned from a long-awaited vacation in Mexico, where I got plenty of work done on my latest book. In the process, I discovered a few utilities that are especially useful for computing far from home. First, there's *Sourcer*, which can disassemble any .EXE or .COM file into assembly language text. *Sourcer* is a true wizard at this tricky job, displaying an uncanny ability to separate code from data, thereby locating all of a program's subroutines and variables. *Sourcer* converts any code file into a commented listing, which you can then reassemble with Microsoft's Macro Assembler or Borland's Turbo Assembler. This means you can modify a *Sourcer*-generated listing to revise programs for which you don't have the original source code.

A companion program, *BIOS Pre-Processor*, helps *Sourcer* generate a commented listing of your system's ROM BIOS. Having this listing on disk sure beats lugging around reference manuals—especially if you like to travel light, as I do. The resulting source code listing—about 500K long for my 20MB Toshiba T3100 portable—provides a first-class reference to all BIOS function calls and data for any IBM PC or compatible.

Speaking of source code listings, now that I'm regularly using more than one PC, keeping track of file versions is more difficult. I'm solving this problem with the *Polytron Version Control System (PVCS)*, which efficiently tracks every text file save and can re-create previous file versions all the way back to the original text. By the way, if there's a Pulitzer Prize for documentation, whoever wrote the superb *PVCS* manual should receive the award.

Project managers should take a serious look at *Corporate PVCS* and NETBIOS-compatible *Network PVCS*, designed to help team members share files with no danger that two programmers will accidentally update the same routines simultaneously. Individuals can save money by purchasing the *Personal PVCS* package.

In addition to source code, I stuff various notes, lists, and tables onto my disk. Lately, I've been saving most of these items as plain ASCII text, using one program (*Brief*) to edit this column, to work on listings, to keep notes, and to write my book chapters, thus reducing the amount of software I have to cart around. The problem is that *Brief* lacks the report, search, and sorting abilities of a data base manager. Then I discovered AWK, a programming language written by Alfred V. Aho, Brian W. Kernighan, and Peter J. Weinberger. (AWK is an acronym for the authors' last names.)

PolyAWK The Toolbox Language comes with an Addison-

Wesley book, *The AWK Programming Language*, written by AWK's authors. There's no other documentation. Although the book describes AWK for UNIX, a README file explains how to use PolyAWK under DOS. AWK is somewhat like C in style, but it is tailored specifically to processing ASCII text files with a combination of pattern-matching expressions and programmable actions. I'm about halfway through the book and no AWK expert, but from what I've learned so far, AWK will let me develop useful tools to organize my growing text-file collection.

With source code and ASCII text tools like *Sourcer*, *PVCS*, and AWK, I'm all set to travel, taking along a single editor, good version control, and the ability to disassemble code and produce a BIOS listing when I'm far from my reference library, plus a programming language to process ASCII files. Now, if somebody will please tell me how to avoid relentless questions from custom agents about my computer, I'll be happy. —*T. S.*

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Tom Swan is the author of Mastering Turbo Pascal 4.0 *and the forthcoming* Mastering Turbo Assembler *(both published by Howard W. Sams, Indianapolis, Indiana).*

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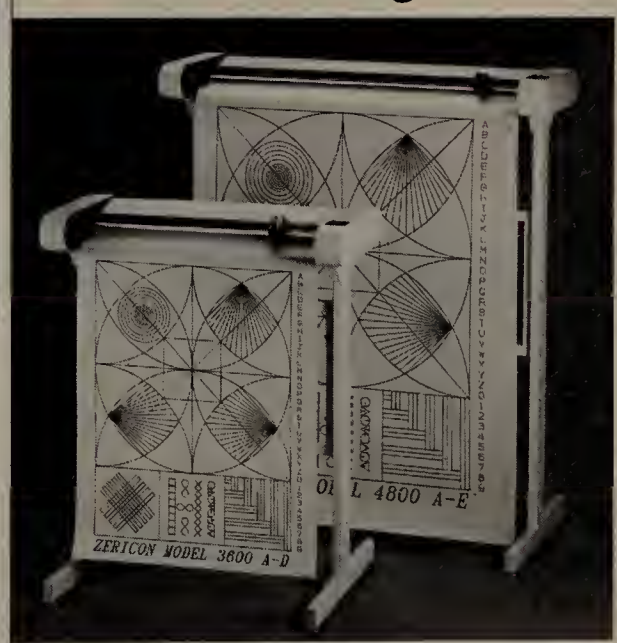

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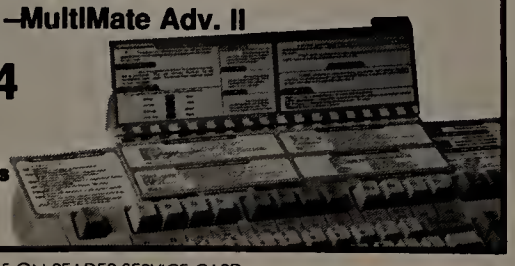

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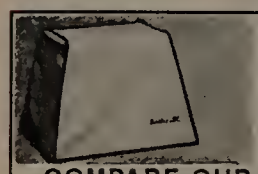

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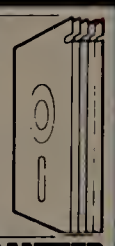

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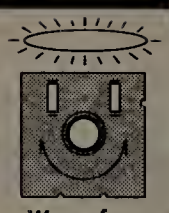

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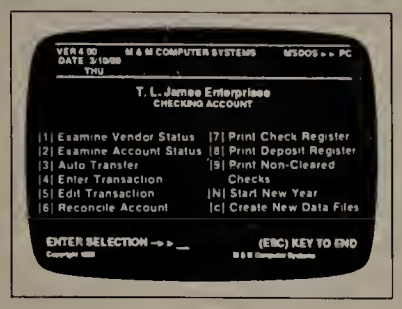

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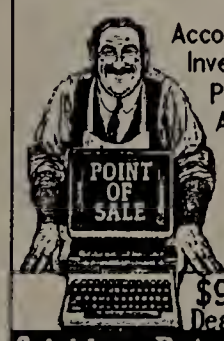

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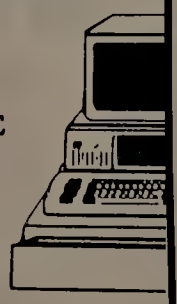

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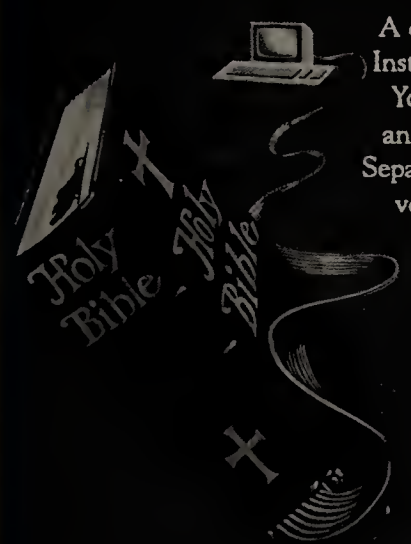

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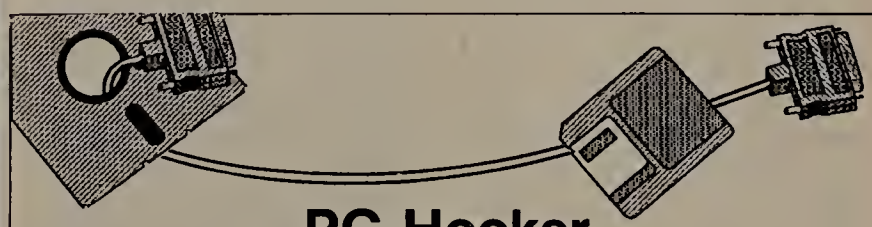

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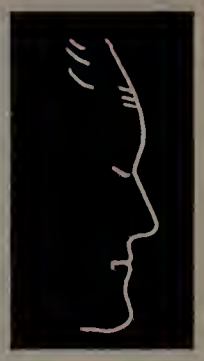

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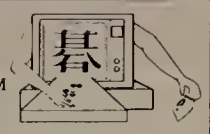

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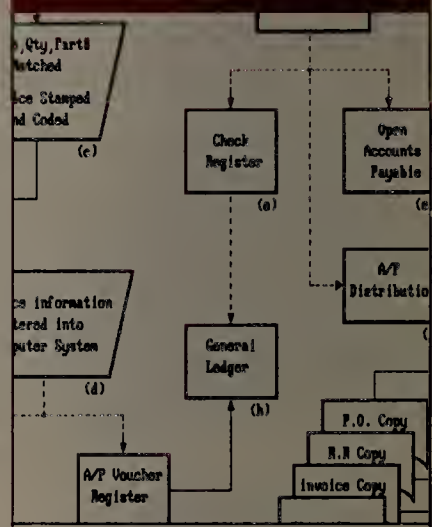

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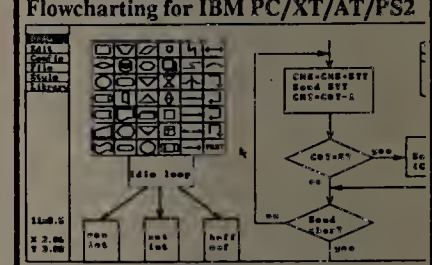

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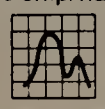

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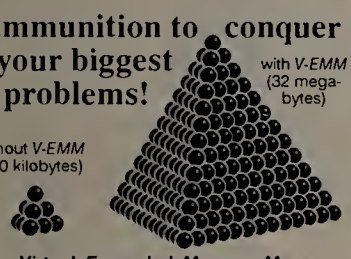

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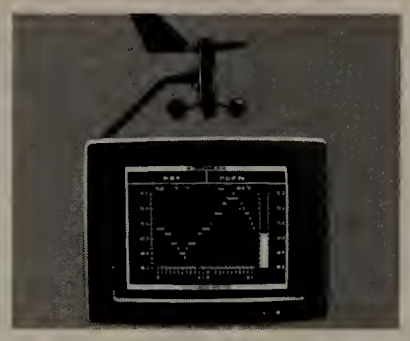

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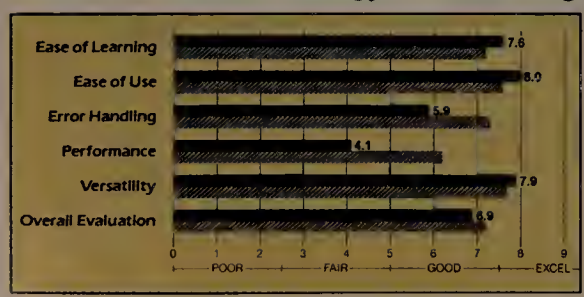

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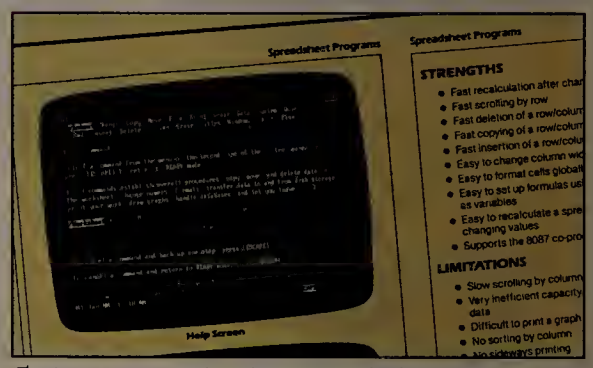

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★★★★	8.0	Q&A	pre-3.0 2.0	■	■	■	■	■	512K	$349	✓	✓	✓	28
★★★	7.7	PFS:Professional File	1.01	■	■	■	■	■	256K	$249	✓	✓	✓	22
★★★	7.2	PowerBase	2.3	■	■	■	■	■	384K	$349	✓	✓		24
★★	6.4	RapidFile	1.0	■	■	■	■	■	256K	$295	✓	✓	✓	30
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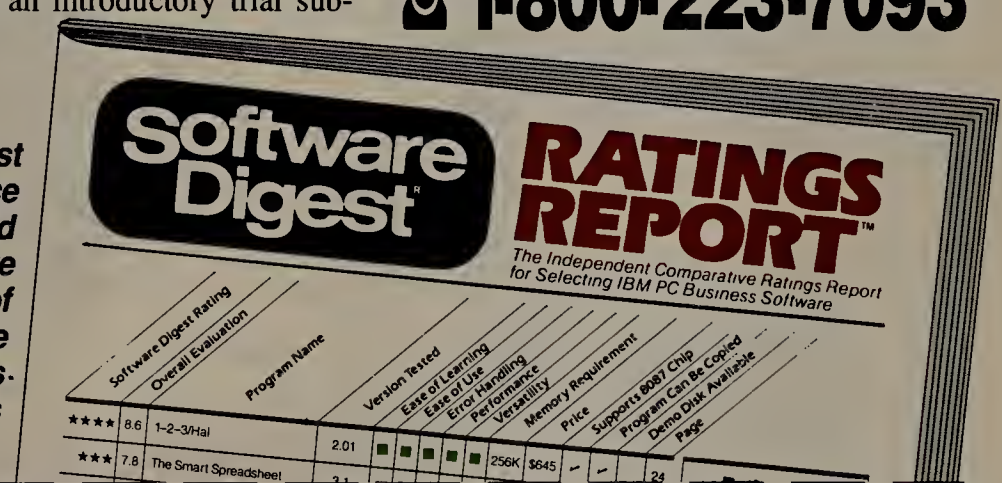

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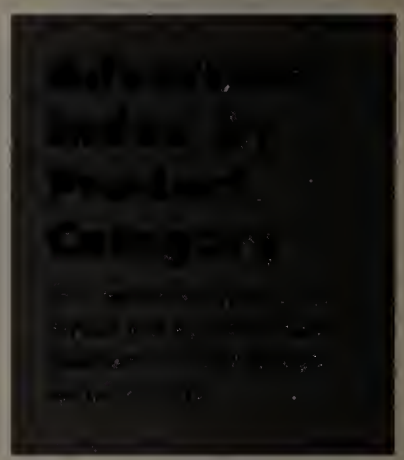

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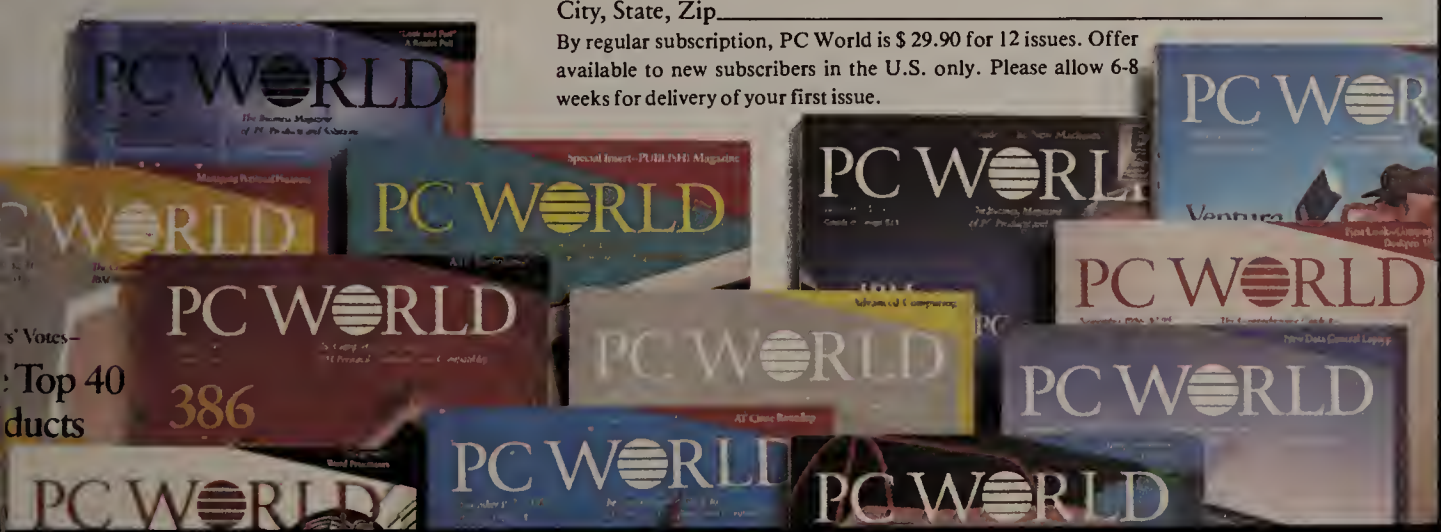

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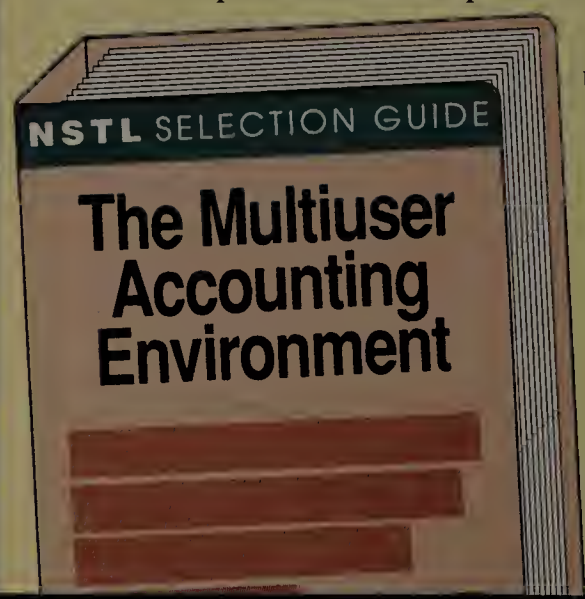

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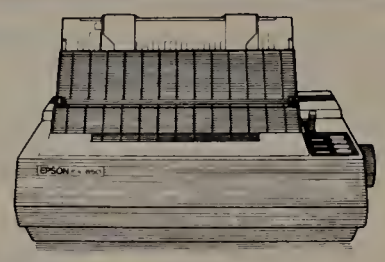

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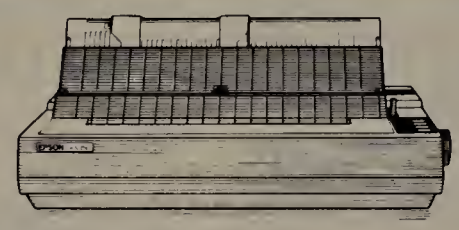

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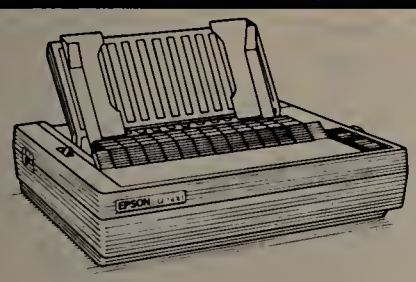

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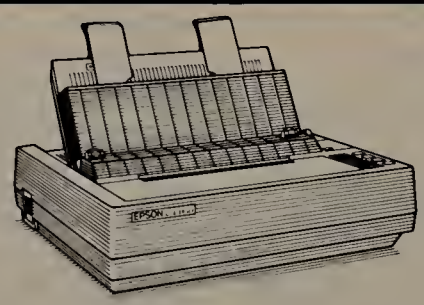

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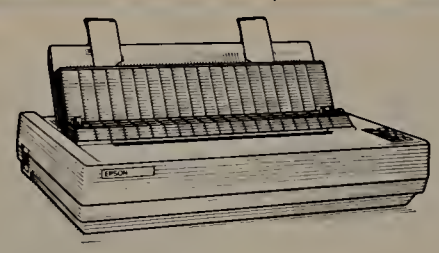

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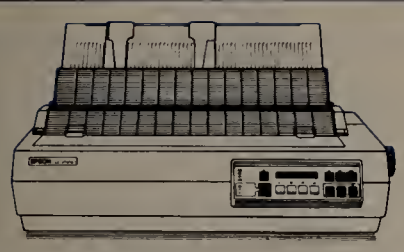

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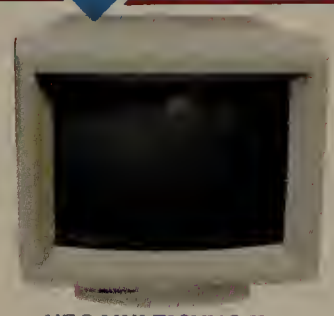

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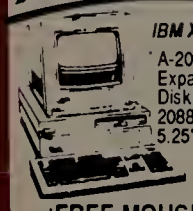

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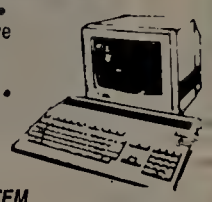

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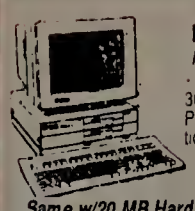

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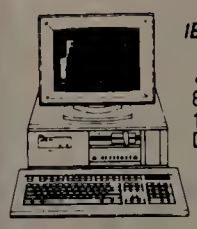

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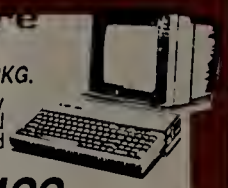

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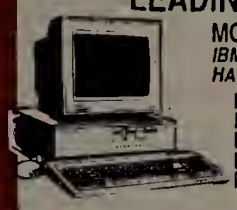

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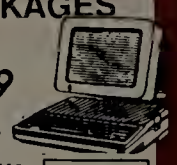

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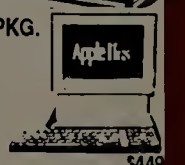

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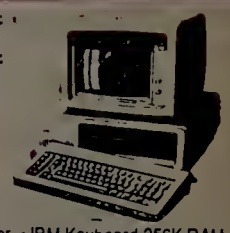

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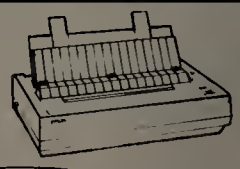

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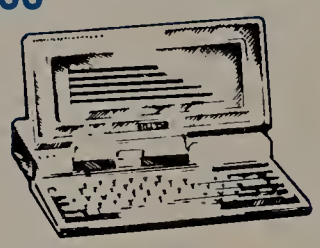

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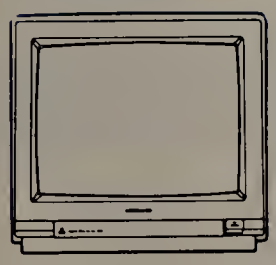

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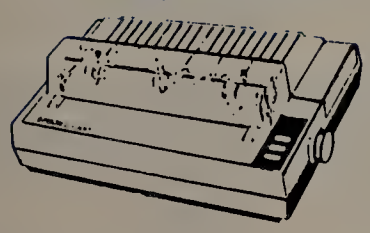

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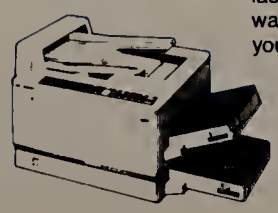

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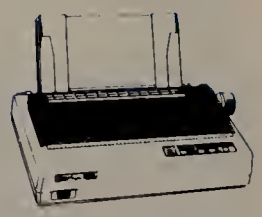

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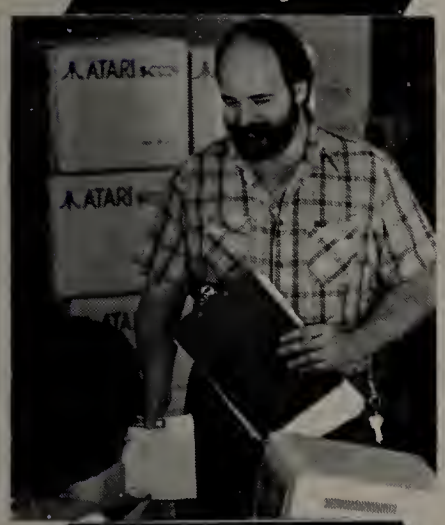

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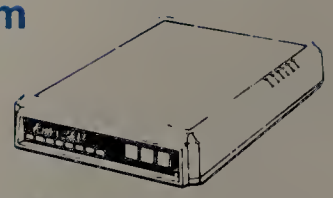

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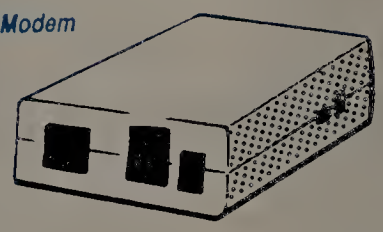

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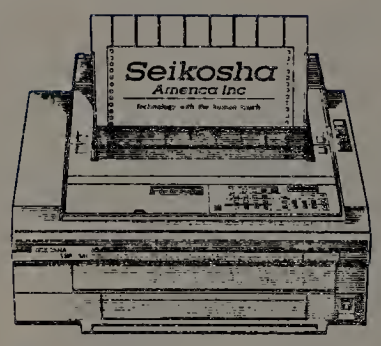

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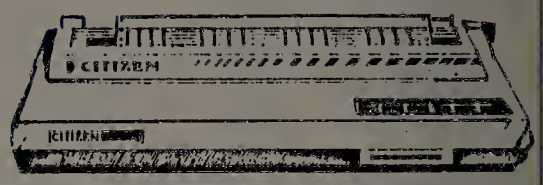

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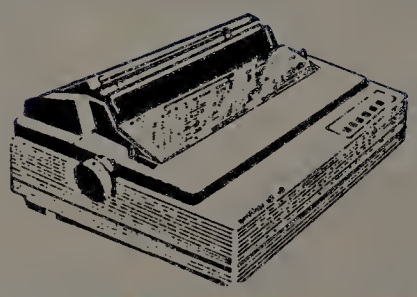

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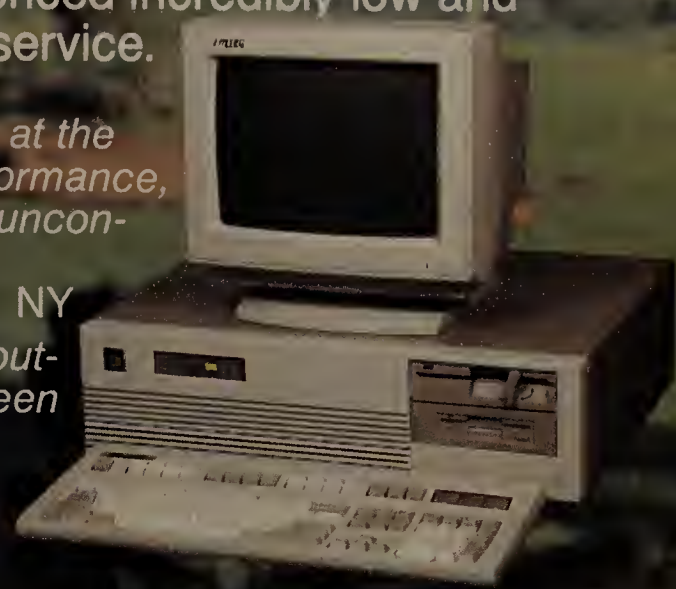

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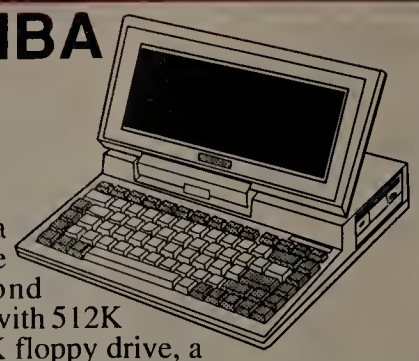
TOSHIBA T1000 $749



The Toshiba T1000 is the perfect second PC! It comes with 512K of ram, a 720K floppy drive, a supertwist LCD screen and MS-DOS in rom! All this in a battery-powered 7 pound package. A 768K ram card is just $269 and can be set as base, expanded, or a non-volitile ram disk.

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P321SL Narrow	**$459**
P341SL Wide	**$629**

HARDWARE

PRINTERS

	LIST	FAST
ALPS		
Allegro 24	499	315
Citizen		
120D	229	145
180D	259	165
MSP40	449	299
Tribute 124	599	429
Tribute 224	899	599
Diconix		
150P	499	299
Epson		Call
Fujitsu		
DL3400	995	549
NEC		
P2200	569	339
P5200	799	509
P5300	1049	669
LC890	4799	Call
Okidata		
182 Plus	319	219
320	499	329
390	699	469
393 (Req. Interface)	1399	915
Panasonic		
KXP1080i-2	299	159
KXP1091i-2	329	185
KXP1124	529	315
KXP1595	749	419
KXP1524	949	519
Star		
NX1000	289	169
NX2400	499	319
NB2410	699	449
Toshiba		
P321SL	749	459
P341SL	999	629
P351SX	1499	929

BOARDS

	LIST	FAST
AST		
Hot Shot 286	645	339
Six Pak Plus 64K	210	119
DTK		
286 10mhz M/B	499	249
XT 1.2mb FDC	79	45
Everex		
1200B Int Modem	149	69
2400B Int Modem	249	129
Genoa		
Super EGA Hi-Res+	399	169
Super VGA #5100	445	239
VGA Hi-Res #5200	645	359
Hercules		
Graphic Card +	299	169
Intel		
8087-2	250	149
80287-10	480	249
Above Board 286	645	Call
Orchid		
Designer VGA	545	299
Tiny Turbo 286	445	269
Twin Turbo 12mhz	645	359
Paradise		
Autoswitch 480	349	169
VGA Plus	399	259
VGA Plus 16	499	299
VGA Professional	799	Call
Practical Peripherals		
1200B Int Modem	99	65
2400B Int Modem	199	149
Prometheus		
Promodem 2400B	199	129
Promodem 2400G	249	159

The Complete PC		
Answering Machine	349	219
Fax	399	249
Hand Scanner	249	159
USRobotics		
1200 Baud Internal	149	69
1200 Baud External	179	89
2400 Baud Internal	249	119
2400 Baud External	279	149
Video 7		
Fast Write VGA	549	335
Vega Deluxe	379	189
Vega VGA	499	259
V-RAM VGA	899	Call

LAPTOPS

Mitsubishi		
MP-286L Dual	3195	1879
MP-286L 20mb	4595	2449
NEC		
Multispeed EL II	2295	1449
Multispeed HD	3695	2249
Sharp		Call
Toshiba		
T1000	1249	749
T1200F	2099	1369
T1200FB Backlit	2399	1499
T1200HB Backlit	3599	2399
T1600		Call
T3200	5799	3695
T5100	7499	4595
Zenith		
SuperSport Dual	2399	1599
SuperSport 20mb	3599	2399
SuperSport 286 20mb	4999	3295

MONITORS

	LIST	FAST
Magnavox		
7BM749 VGA	229	149
9CM082 VGA	649	419
Mitsubishi		
1409 RGB	399	259
1410 EGA	599	399
Diamond Scan 1381	799	489
NEC		
Multisync II	899	575
Multisync Plus	1399	869
Princeton		
Max15	389	Call
Utltrasync	849	479
Utltra 16	1375	859
Seiko CM1430	995	599
Sony		
1302 Multiscan	995	659
1303 Multiscan	825	479
Zenith 1490	999	599

DISK DRIVES

Miniscribe		
40MB AT #3650	499	319
Mitsubishi		
40MB AT MR535 22ms	825	399
Seagate		
20MB XT Kit #225	599	267
30MB XT Kit #238	699	287
40MB AT #251	899	349
40MB AT #251-1	999	449
80MB AT #4096	1199	549
Toshiba		
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720K 3.5" Floppy	149	87
1.2MB 5.25" Floppy	149	87
1.44MB 3.5" Floppy	189	100

Call On Non-Listed Items

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DataEase	600	379
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dBXL Diamond	199	105
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Paradox	725	399
Quartz	795	449
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Reflex	150	84
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Bedford Integr. Acct.	249	149
BPI		Call
Computer Associates		Call
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DAC Payroll 3.0	99	59
Dollars & Sense	179	99
In-House Accountant	199	109
Managing Your Money	199	117
Peachtree Complete II	199	149

Graphics

	LIST	FAST
Boeing Graph	395	199
Deluxe Paint II	105	67
Draw Applause	495	269
First Graphics	129	Call
Freelance Plus	495	Call
GEM Draw Plus	299	165
Generic CADD	99	49
Graph Plus	495	299
Harvard Graphics	495	Call
Integrated		
First Choice	159	95
Works	149	89
Windows 286	99	59
Windows 386	195	117
Mice		
Logitech C7 Serial/Bus	119	65
Logitech HiRes Bus	150	83
Microsoft Serial/Bus	150	95
Microsoft W/ Windows	200	129
PC Mouse II Serial/Bus	149	84
Power Protection		
Curtis Ruby Plus	115	59
Datasheild 85	90	50
Datasheild 100	99	57
Isobar 4-6	80	42

Programming

	LIST	FAST
Macro Assembler	150	89
Norton Guides (Specify)	100	58
Turbo Basic	99	58
Turbo C 2.0	149	87
Turbo Pascal 5.0	149	87
Quick Basic	99	59
Quick C	99	59
Spreadsheets		
Excel	495	Call
Lotus	495	Call
Lucid 3-D	149	79
Quattro	248	139
Worksheet Utilties	100	55
Utilities		
CoreFast	149	87
Desklink	170	95
Desqview	130	73
Fastback Plus	189	87
FastTrax	50	33
Formtool	95	54
Laplink Plus	140	77
Norton Advanced	149	74
PC Tools Deluxe	80	36
Sidekick Plus	195	119
XTree	70	34

Word Processors

	LIST	FAST
Easy Extra	99	55
GEM First Word Plus	199	117
Grammatik III	89	49
Manuscript	495	Call
Multimate Adv. II	565	247
Professional Write	199	105
Rightwriter	95	49
Sprint	195	119
Q & A Write	199	119
Webster's Writer	60	47
Word	450	Call
Word Perfect	495	Call
Word Perfect Library	129	59
WordStar Prof. 5.0	495	219
XyWrite III Plus	445	299

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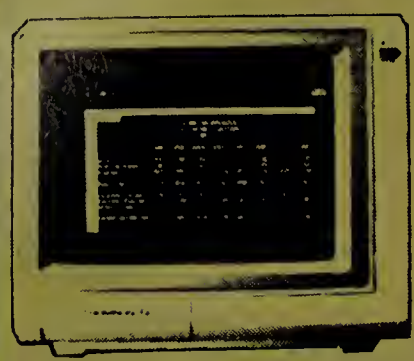

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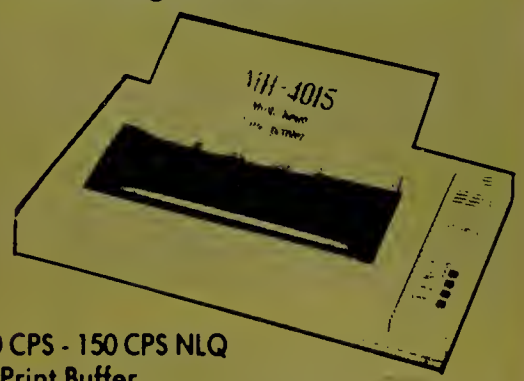

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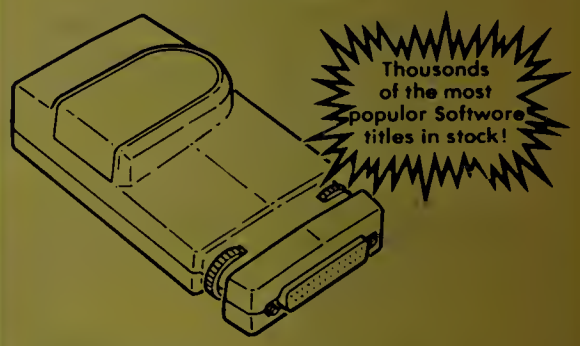

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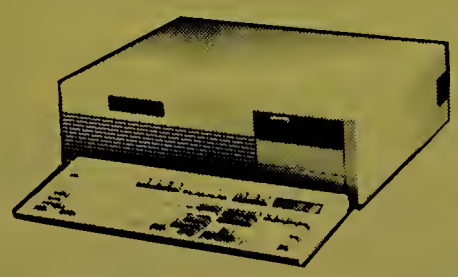

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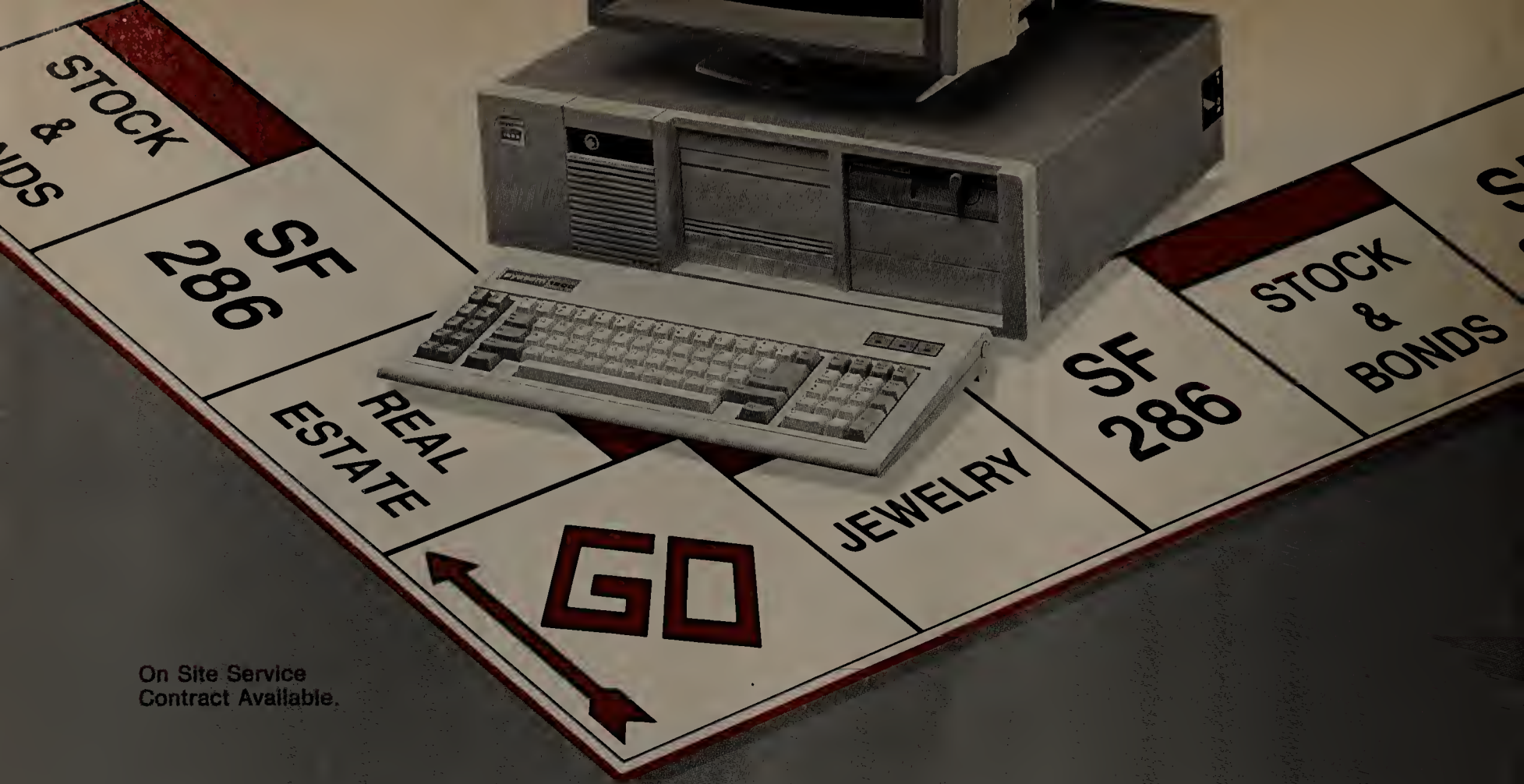

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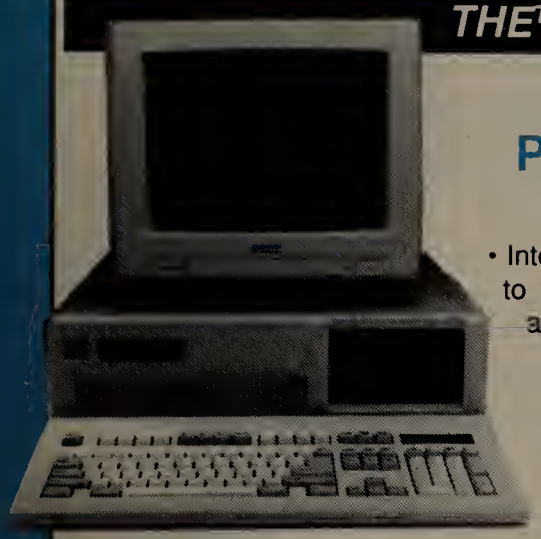

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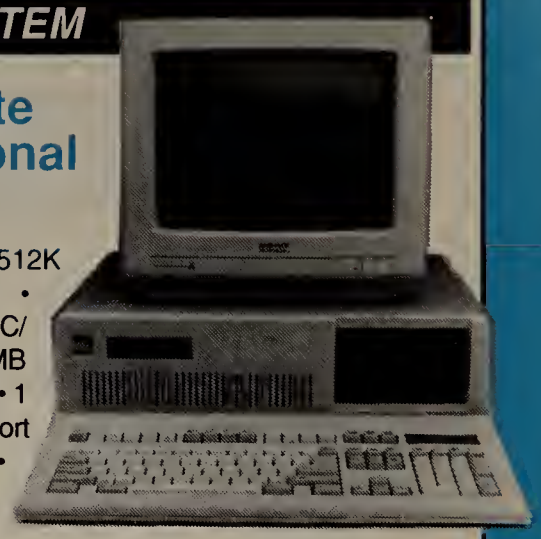

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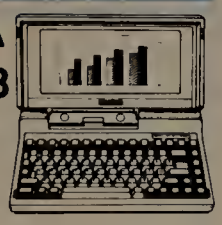

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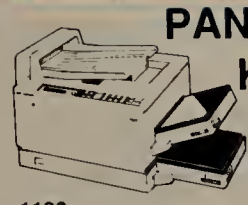

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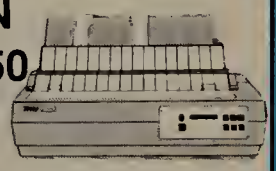

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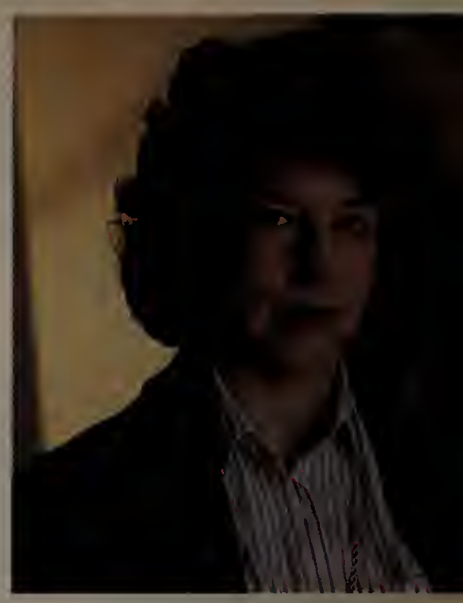

Mary A. Dolce

Recently the media has been awash with stories about computer viruses. The subject has been covered in detail by the computer press, the national print media, and radio and TV.

Often the coverage pumps up the horror stories told by victims of these destructive programs. In addition, some reporters are guilty of using scare tactics when they compare computer viruses to the AIDS virus. Predictably, all the attention has raised undue fear among PC users.

The articles imply that the best way to protect yourself from viruses is to purchase factory-sealed software from large vendors at retail outlets, avoiding software found on electronic bulletin boards.

This advice is misleading. The relatively few actual virus outbreaks have included assaults on the packages of big-name vendors. If those suppliers don't take precautions, they can be as easily victimized as users and distributors of public domain software or low-priced shareware.

In fact, software saboteurs would prefer to attack large companies rather than PC users in general.

Many of us in the user group community worry that this bad publicity will limit the practice of using public domain software and shareware, which have been fertile sources of inexpensive software for a wide range of users. It's hard to imagine where PC communications would be today if Ward Christensen hadn't developed the XMODEM protocol and placed it in the public domain; from there it found its way into numerous commercial communications packages.

Despite the hysteria surrounding viruses, users can take some simple preventive measures against the threat of destructive software.

For example, since viruses often attach to DOS's COMMAND.COM file, you can check for changes in the date or file size, which might indicate the presence of a virus. *The Norton Utilities* and several public-domain packages, when hooked to your AUTOEXEC.BAT file, allow you to check COMMAND.COM and detect an infected file before it does damage.

Since virus software does not attach to read-only files, another preventive measure is to convert your .EXE and .COM files to read only. (This is a sensible procedure in general; the DOS command is ATTRIB +R *filename*.)

Additionally, you should know the sources of your software and stay informed about local viral activity through your user group. At the Chicago Computer Society, we maintain a listing of bogus software, including known pirated software, Trojans, and computer viruses.

We also keep up to date on antiviral programs. Two of our favorites are *Ficheck* version 4 and *Flushot* version 4, but there are many others. Check with local user groups for more information.

Computer viruses are a real problem that needs to be addressed. But despite what the press would have you believe, the sky is not falling. ●

Mary A. Dolce is president of the Chicago Computer Society and a systems consultant at Baxter Healthcare in Deerfield, Illinois.

Have a different perspective? Write Dan Lavin, User Ombudsman, PC World, *501 Second St., San Francisco, CA 94107.*

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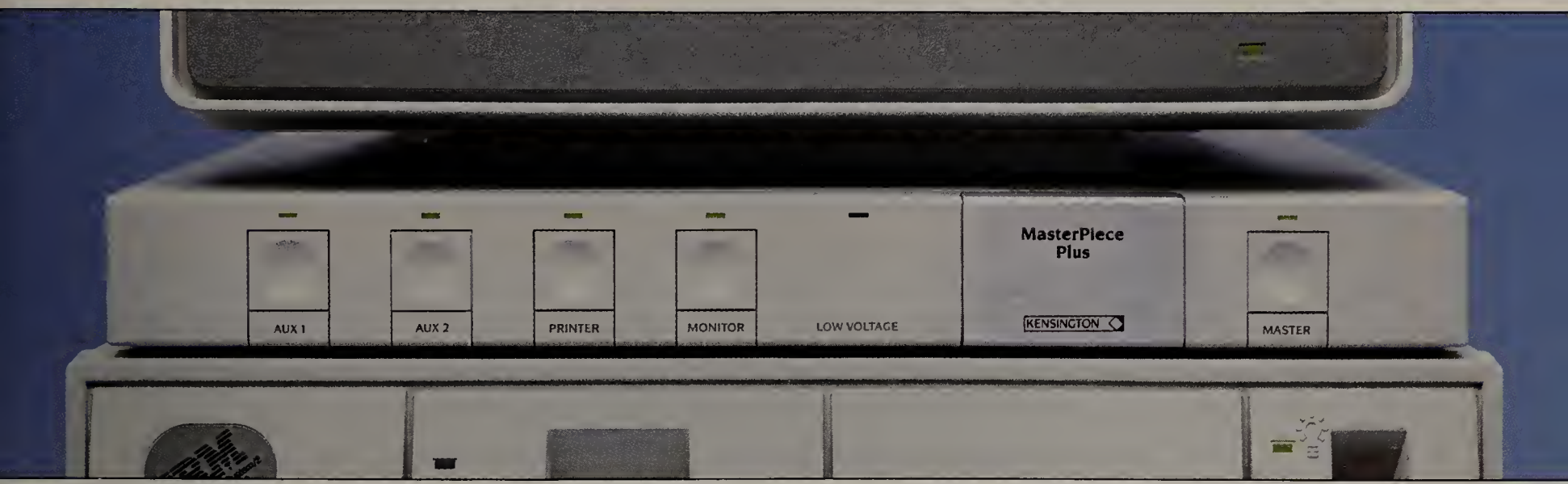

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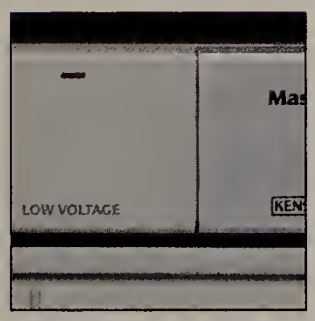

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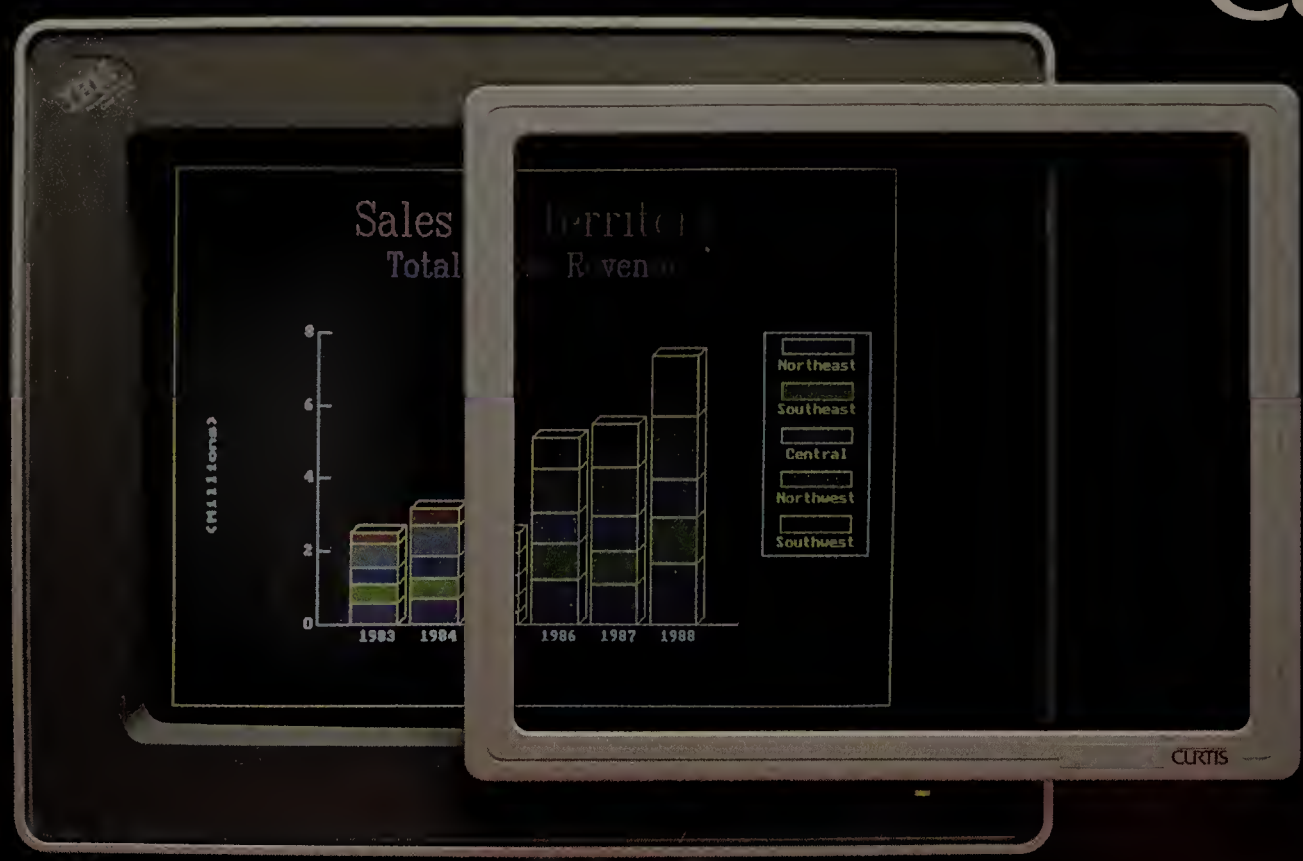

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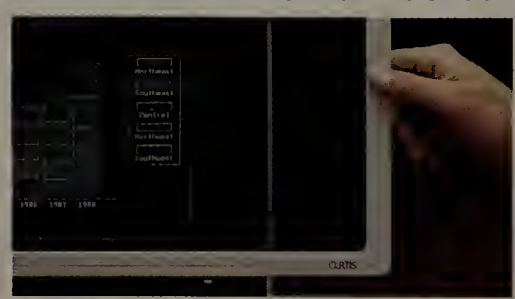

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